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New Rapido HO scale EMD E8 tested p.56

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Get your layout started!

- Lance Mindheim offers tips on benchwork
- trackwork • wiring • and more p.28

A Pacific Northwest N scale layout built for train-watching p.34

Richard Remiarz shares his Great Northern in Trackside Photos. p. 64

PLUS

Make tall grass for your layout p.24

Scratchbuild an art deco station p.43

Waterfront railroading with car ferries p.48

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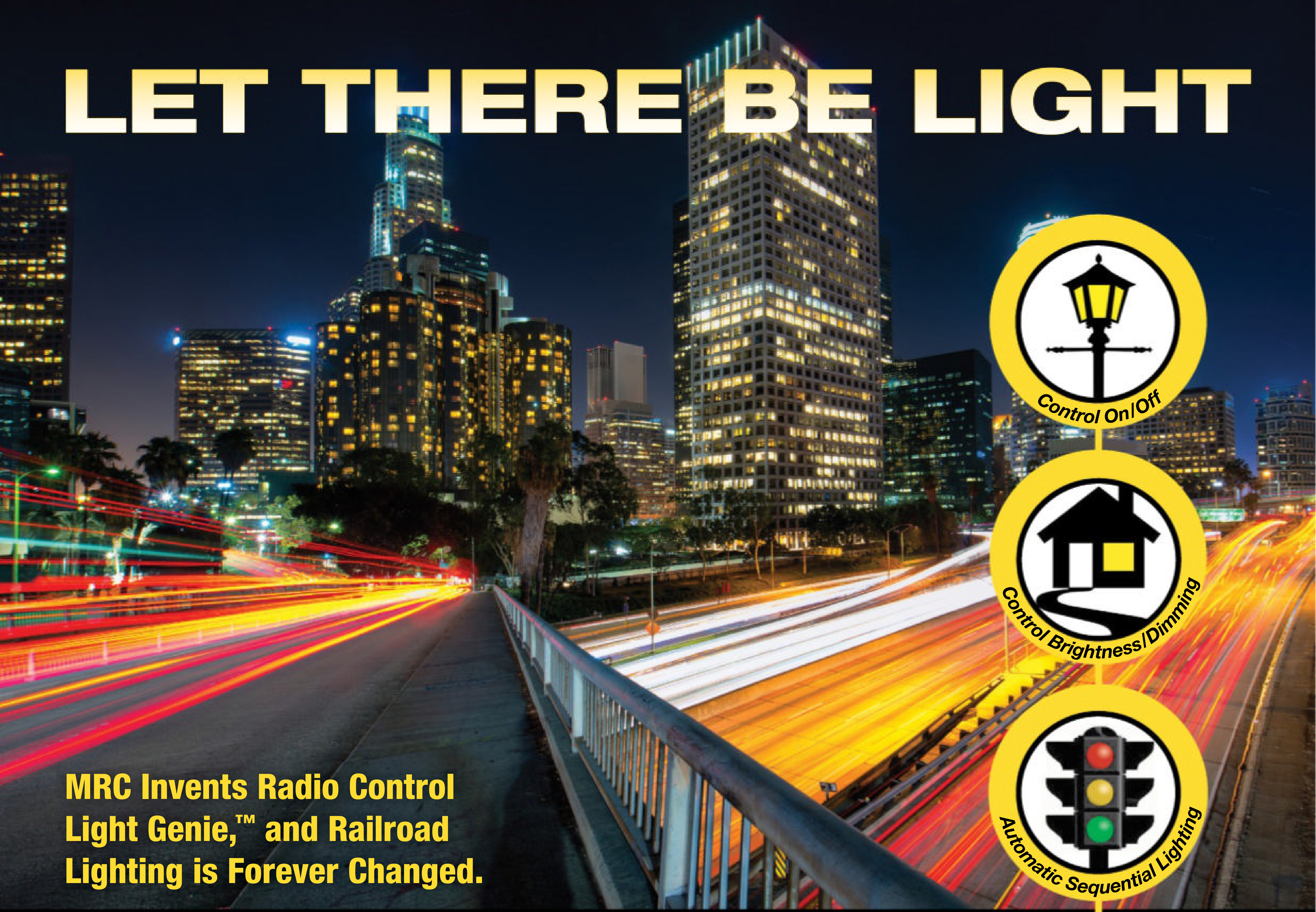
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Volume 90, Number 2

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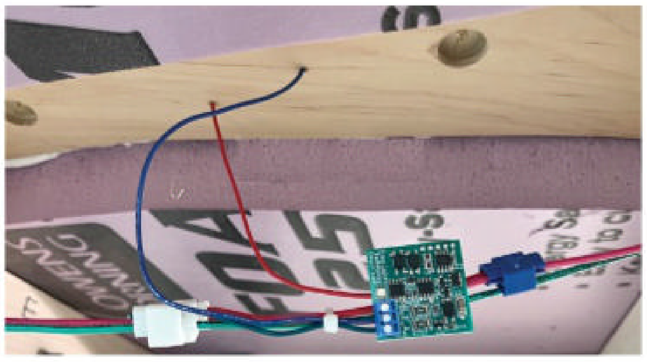

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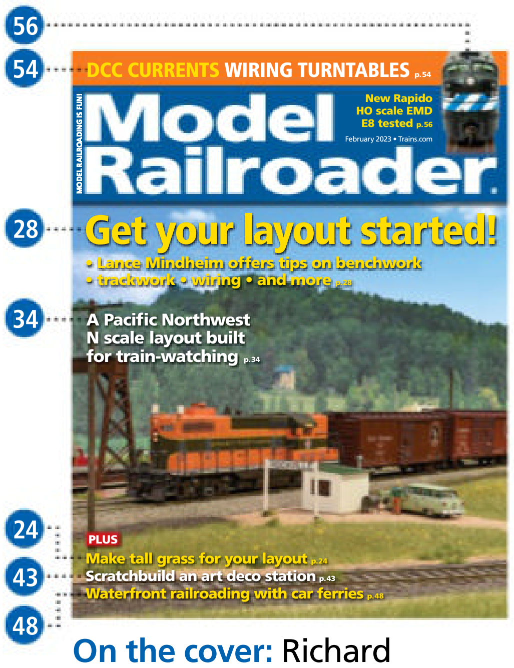
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On the cover: Richard Remiarz shares his HO scale Great Northern layout in Trackside Photos. See page 64. Richard Remiarz photo

Next issue

In March, check out the scenery for the Bishop Street project layout. Plus, visit a layout lighted for night operations, see an N scale railroad in a coffee table, and more!

Model Railroader (USPS 529-810, ISSN 0026-7341) is published monthly by Kalmbach Media Co., 21027 Crossroads Circle, P.O. Box 1612, Waukesha, WI 53187-1612. Periodicals postage paid at Waukesha, Wis., and additional offices. POSTMASTER: Please send address changes to *Model Railroader*, P.O. Box 8520, Big Sandy, TX 75755. Printed in USA. Canada Publication Mail Agreement # 40010760.

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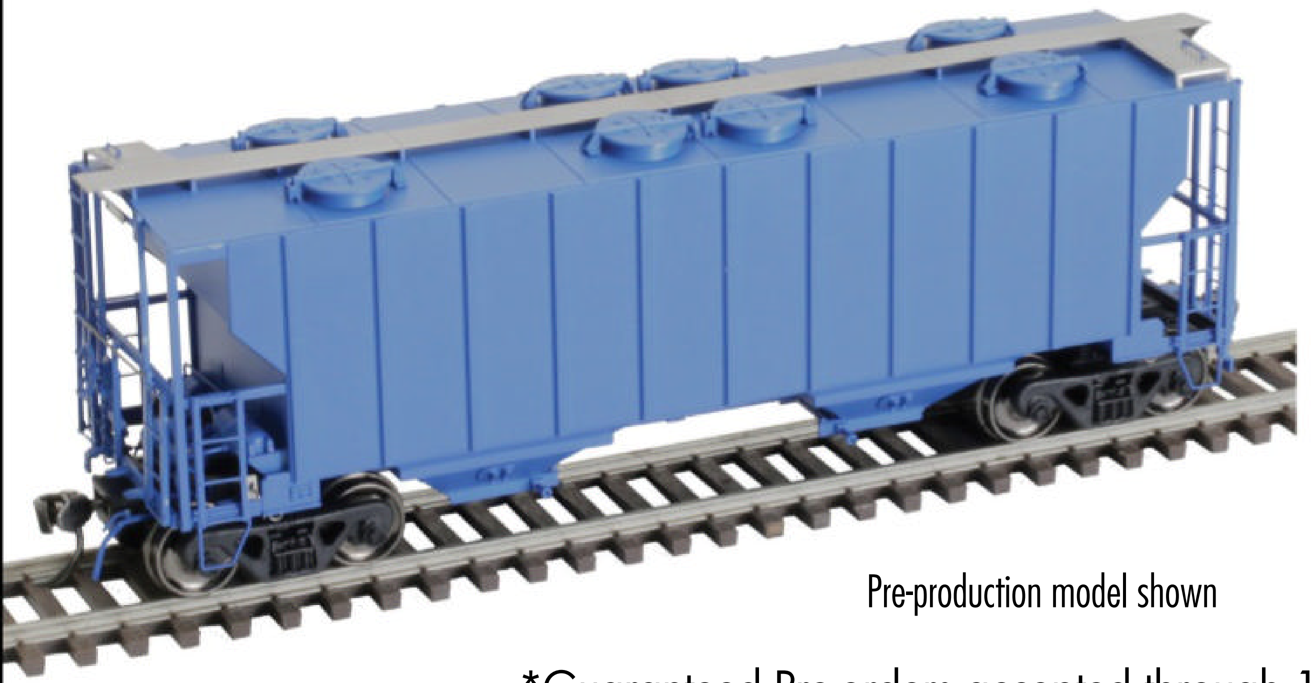

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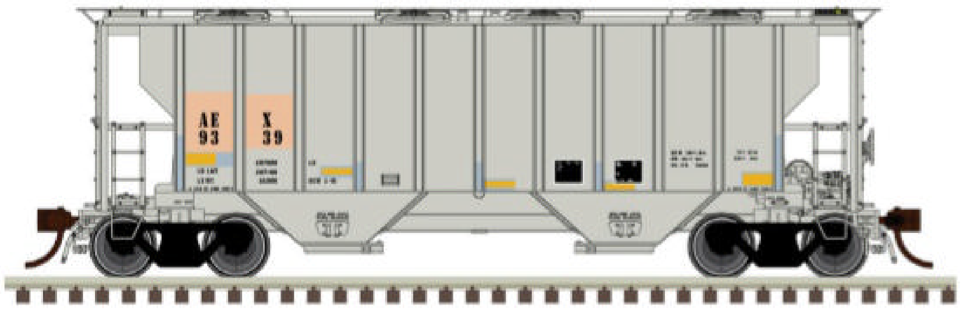

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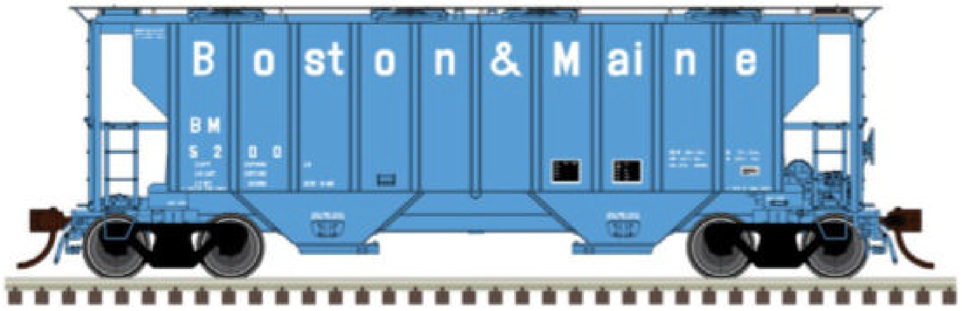
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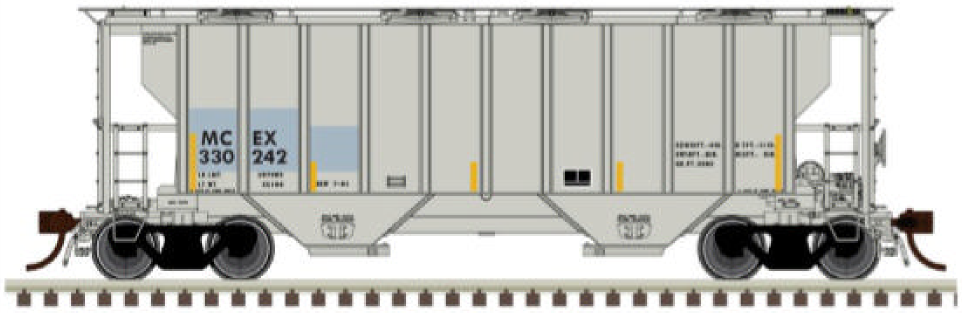
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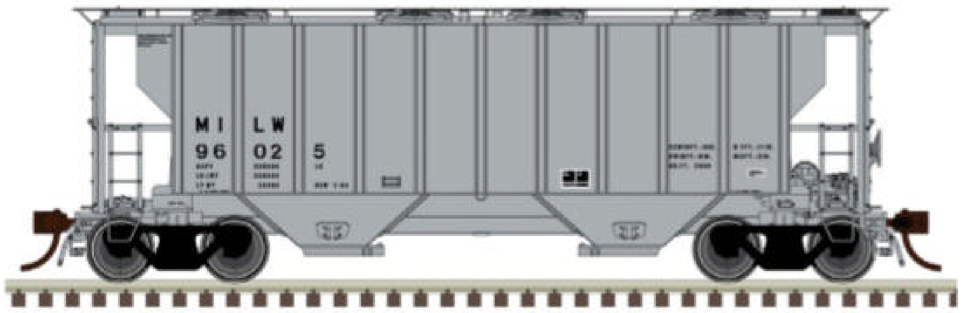

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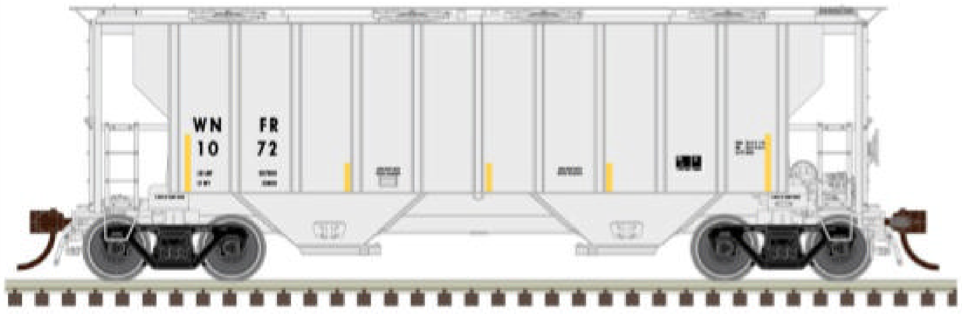

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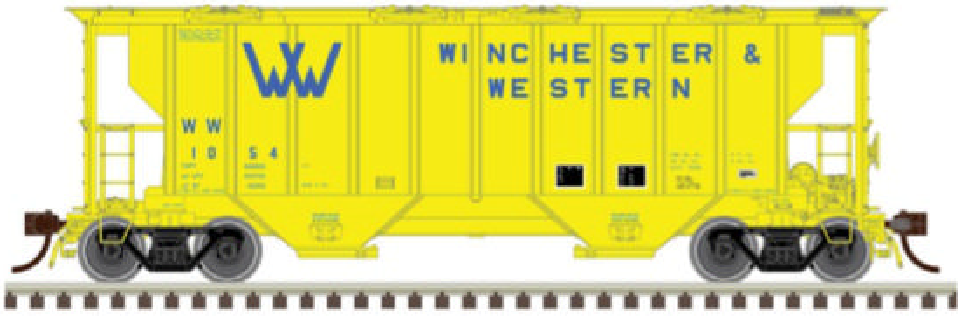
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Conducted by Mitch Horner

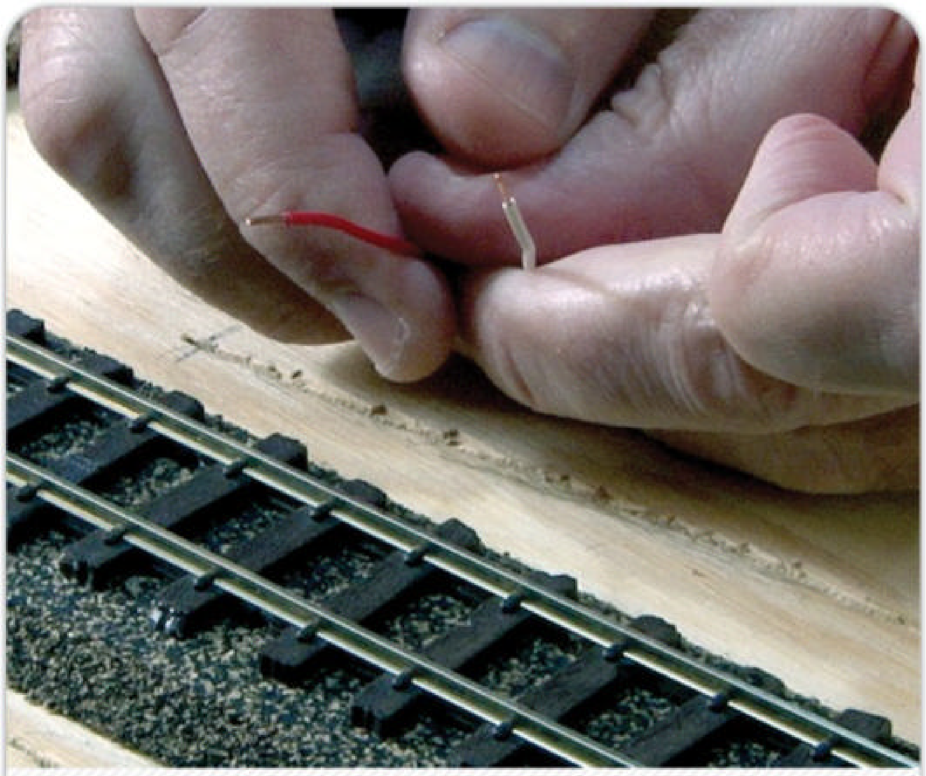
Modeling rocks on a budget

Learn how to accurately model rocks on a budget with senior associate editor Steven Otte. These accessible and budget-friendly techniques – from foil rock molds to carved foam to tree bark – can help any modeler learn to model rock faces in a cost-effective fashion. Find it under the Build a Model Railroad section.

4316
Amtrak

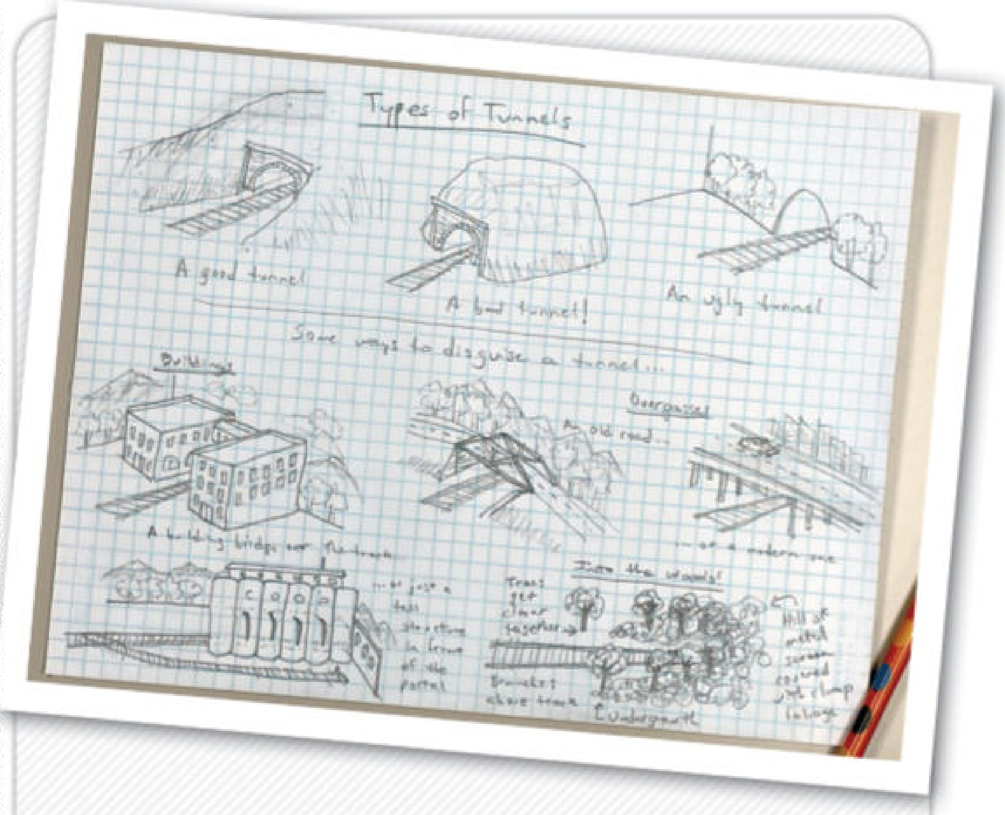
See Rapido's E8 in action

On page 56 of this issue, we review Rapido's HO scale EMD E8 diesel in the Amtrak "day one" paint scheme. See the locomotive model in action on MR's house layout, the Milwaukee, Racine & Troy, with commentary from senior editor Cody Grivno. Find the video under Product Reviews.



Soldering feeder wires made easy

Follow along with veteran modeler and Trains.com director David Popp as he demonstrates his technique to solder feeder wires on the On30 Olympia Logging Co. layout. Follow along as David attaches feeders in 10 easy-to-follow steps. Experienced modelers and relative novices alike could learn from these invaluable strategies. Find this article in the Beginners section of our website.



Sketching with Steve

Senior associate editor Steven Otte discusses the good, the bad, and the ugly of model railroad tunnels in his latest "Sketching with Steve." He also sketches out some ways to disguise tunnel portals on your model railroad if your prototype didn't have any tunnels, using buildings, overpasses, and trees. Find this article in the Beginners section of Trains.com.

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By Eric White

Creating and sharing expertise

Are you an expert at everything you do? Many of us have some field of expertise. If we're lucky, we can apply it to our livelihood. But it may be something we just do for our own satisfaction.

Of course, you don't need to be an expert to enjoy doing something, and very few of us have reached expert status without a bit of work. Everything you're now an expert at was something you couldn't do at one point. Then maybe you could do it, but not as well as you'd like. Then you felt like you were mildly competent. Eventually, you realized (or someone told you) you had become an expert. Of course, there might have been some epic failures along the way.

In many cases, it's the journey to "expert" status that's enjoyable. We look back at projects we did when we were first starting in this hobby and we get satisfaction from seeing how our efforts have improved.

We know everyone isn't at the same place in their quest for expertise. That's why every month, we try to bring a variety of stories to *Model Railroader*. We want there to be stories that make you say to yourself "I can do that." We also want stories that make you say to yourself "I can't do that – yet."

We want all of our readers to find something that inspires them to learn a new skill, try a new technique, do a little better on the next thing than they did on the last thing.

This is a hobby of doing. When you complete a project, you have something tangible that you can admire yourself, or share with others. That's something we encourage you to do, as many of you do in various ways.

We get letters and e-mails with photos of projects in different stages of completion, and it's great to see what everyone is working on.

Some of the correspondence is sent with an eye toward publication. Some is sent just to share what a reader is doing. Either is fine, though I'd like to encourage people to think seriously about sharing their expertise with others in the hobby.

While we learn by doing, we can learn much faster if someone shares their experiences with us. That's the purpose of this magazine. It's one thing to see a beautiful model railroad featured in a layout visit story, but it's really helpful to know how an effect was achieved.

This is a hobby of sharing, either with friends and family, or with the broader hobby. This magazine is a way to share your expertise.

If you'd like to share what you know to help improve people's enjoyment of the hobby, please get in touch. Whatever your area of expertise, we can find a place for it in the magazine. Contribution guidelines are just a few lines down!

Model Railroader

Model railroading is fun!

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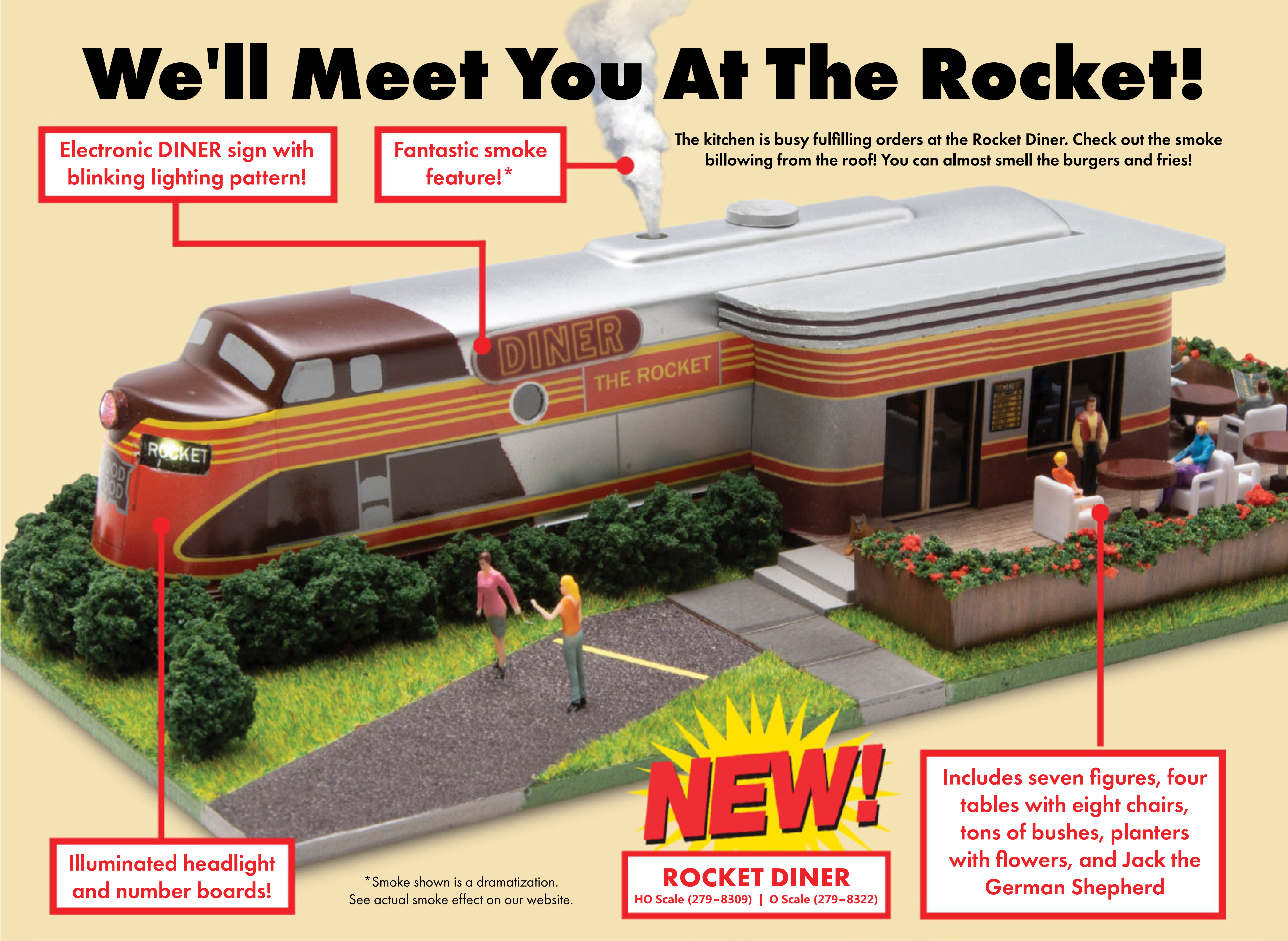
We'll Meet You At The Rocket!

The kitchen is busy fulfilling orders at the Rocket Diner. Check out the smoke billowing from the roof! You can almost smell the burgers and fries!



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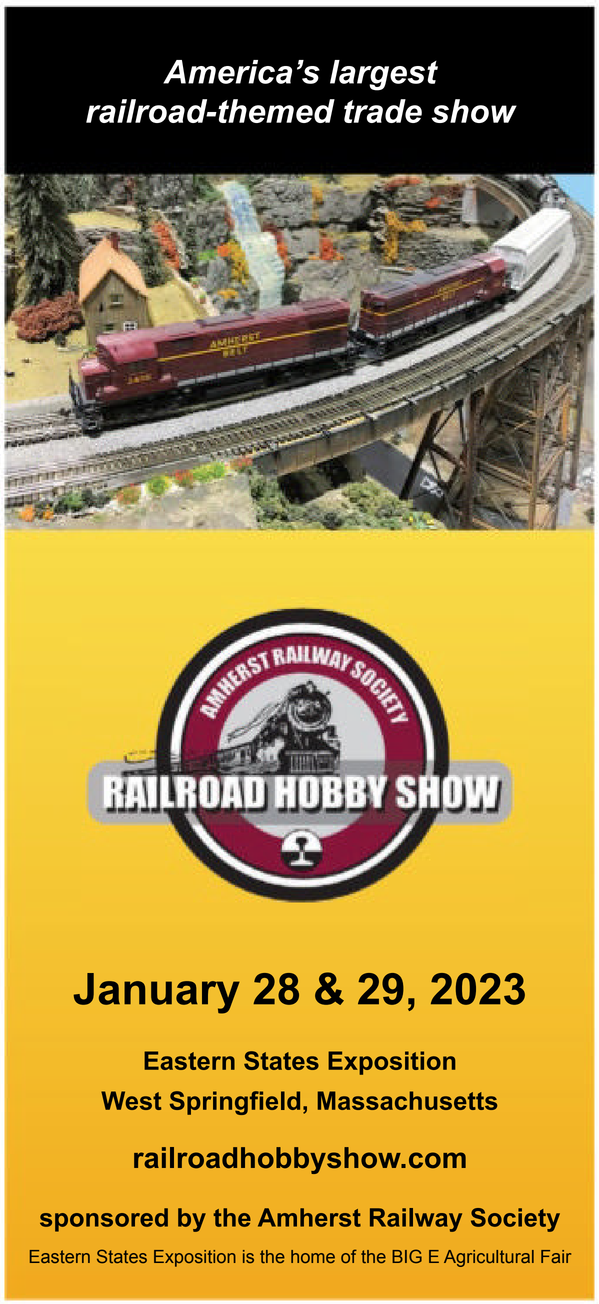

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HO scale

Electro-Motive Division GP7 diesel locomotive. This Athearn Genesis four-axle road switcher is in stores now. The HO scale Electro-Motive Division diesel is decorated for the Pennsylvania RR (Dark Green Locomotive Enamel); Bangor & Aroostook RR (dark blue and yellow in two road numbers; red, white, and blue Bicentennial scheme in one number); Kansas, Oklahoma & Gulf (black, red, and white in one number); Midland Valley (black, red, and white in one number); and St. Louis-San Francisco (Frisco, orange and white). Three road numbers per scheme unless noted. The locomotives have railroad-specific details, a die-cast metal chassis, a full cab interior, etched-metal radiator intake grills and fan grills, wire grab irons, and Celcon handrails. Direct-current models are priced at $219.99. Models with a dual-mode SoundTraxx Tsunami 2 sound decoder sell for $319.99. Athearn Trains, 800-338-4639, athearn.com

Trainfest returns after a two-year hiatus

Trainfest was back for the first time since 2019, and manufacturers had plenty of products to show off. The two-day show, held at State Fair Park in the Milwaukee suburb of West Allis, Wis., was presented by Kalmbach Media.

Veteran manufacturers like Athearn had products to showcase, like its HO scale Genesis Union Pacific SD59MX diesel locomotive with all-new tooling and the new N scale Genesis 13,000-gallon acid tank car with Type F double-shelf knuckle couplers.

Atlas had pre-production samples of its HO scale Metra Nippon Sharyo Type 8500 cab car and Type 6000 trailer car. In addition, a sample of the HO Portec 3000 covered hopper was on shown.

Rapido Trains had many samples to show off. One highly-anticipated model, the HO scale GP38, was on display. The HO scale Budd Slumbercoach, which will be available in multiple road names, was also showcased.

Newer manufacturers in the industry also showed up strong to the show. ClassOneModelWorks.com had samples of its General Steel Castings heavy duty depressed-center flatcars. Additionally, Prairie Shadows had examples of its 3,800-cubic-foot capacity cylindrical covered hoppers on display (page 14).

So many more new products were showcased and announced that we couldn't fit everything into print. Head over to Trains.com to check out the Trainfest 2022 livestream recording, with manufacturer interviews, product demonstrations, and more.

HO scale locomotives

- **Canadian and Phase III RS3 diesel locomotives.** Ontario Northland (green, yellow, and red); Boston & Maine (maroon and yellow without lighting box on deck); Canadian National (black and red with "wet noodle" herald and green and yellow); Canadian Pacific (maroon and gray with script and block lettering, Action Red with "Multimark" herald); Delaware & Hudson (blue and yellow); Interstate (cream, gray, and yellow); Long Island Rail Road (blue and yellow); Louisville & Nashville (gray and yellow); Northern Pacific (black and yellow); and Spokane, Portland & Seattle (blue and white). Direct-current model, $219.95; with sound decoder, $319.95. Bowser Manufacturing Co. Inc., 570-368-2379, bowser-trains.com

- **Whitcomb 65-tonner.** Maryland Midland. One road number available. Die-cast metal chassis and hood. Direct-current model, $279.99; with PIKO SmartSound 5.1 sound decoder, $389.99. PIKO America LLC, piko-america.com

HO scale freight cars

- **34-foot 100-ton two-bay hopper.** Granite Rock (orange), Gifford Hill (orange), Golden West Service (blue),

Tangent releases IC Centralia Shops caboose

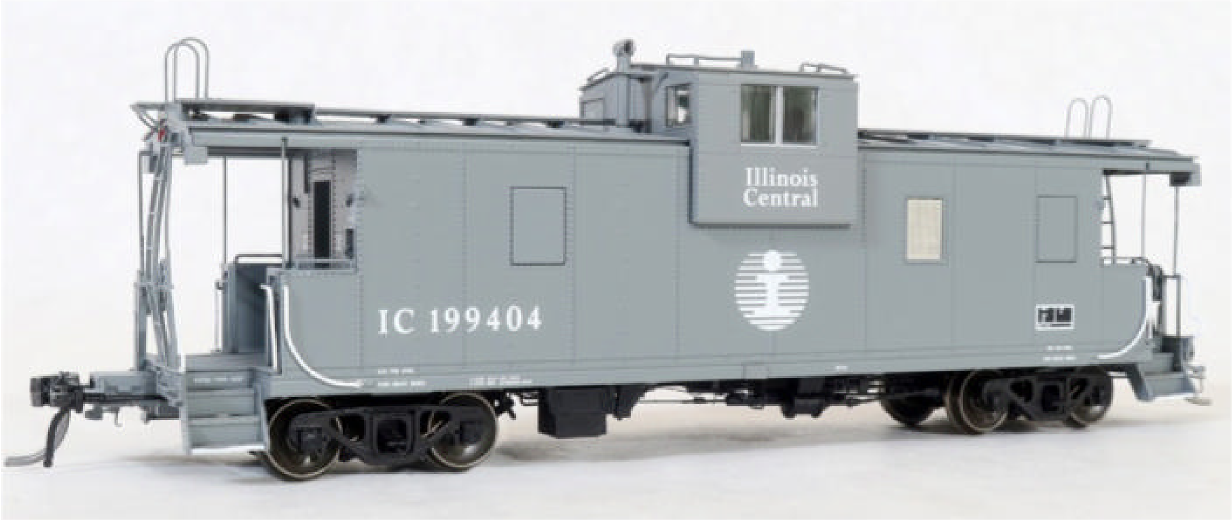
Early Saturday morning during Trainfest, Tangent Scale Models unveiled its newest piece of rolling stock, an Illinois Central Centralia Shops wide-vision caboose. Not only did the firm announce the model, but it was available for purchase at the show. Interest in this caboose by Trainfest attendees was expressed throughout the weekend.

In the 1960s, the IC looked to modernize its caboose fleet and chose to design and build an all-new caboose at its Centralia, Ill., Car Shops. From 1966 to 1972, the Centralia Car Shops and Darby Corp. built 300 cabooses for the railroad in multiple variations. Tangent Scale Models focused on the group of 200 built by the railroad between 1970 and 1972.

Paint schemes in the first run include Illinois Central Gulf (1988+ gray repaint in four road numbers, 1974+ orange I-ball repaint in four numbers, 1978+ simplified orange repaint with herald in four numbers, and 1987+ simplified orange repaint in one number); Canadian National (2005+ and 2007+ red repaint in one number each); Illinois Central (1970 original orange split rail in eight numbers); Chicago, Missouri & Western (1988+ red repaint in one number); and MidSouth Rail Corp. (1989+ gray repaint in one number). Undecorated, unlighted kits and ready-to-run models painted orange are also available.

The caboose features a Pullman-Standard or Stanray roof; Barber or Gould 70-ton roller-bearing caboose trucks with 33" metal wheelsets; Kadee scale couplers; and era- and railroad-specific details, including multiple body, side vents, and side window combinations. In addition, the model has a full IC-specific interior; underbody details, including a brake system with brake rods and piping, a release rod, water fills, an axle generator, and more; wire grab irons; and etched-metal side and end window screens as appropriate.

The Tangent Scale Models Centralia Shops caboose is priced at $119.95. For more information visit, the manufacturer's website at tangentscalemodels.com.



Tangent Scale Models released its HO scale Illinois Central Centralia Shops wide-vision caboose during Trainfest. The injection-molded plastic model is available in multiple body variations, paint schemes, and road numbers.

Norfolk Southern (brown), Southern Pacific (brown), Southern Ry. (black and brown schemes), Union Pacific (black with shield herald and Western Pacific reporting marks), and Wisconsin Central (light gray). Four road numbers per scheme. Undecorated model also available. Factory-applied door and brake details, and die-cast metal underframe. 36" metal wheelsets with RP-25 contours and Proto-Max metal couplers. $31.98; undecorated, $29.98. Mainline series. Wm. K. Walthers Inc., 414-527-0770, walthers.com

- **GATC 8,0000-gallon radial course tank car.** Deep Rock-Cushing (black, 1940+); Burlington Northern (1973+ maintenance-of-way water car in one road number); Cities Service Oil (black, 1937+); Continental Oil (black, 1923+

HO scale

CANADIAN PACIFIC
8912

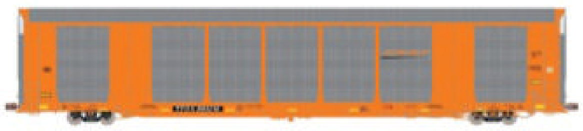
ScaleTrains ES44AC diesel locomotive. This modern HO scale road unit from ScaleTrains is available now. Paint schemes on the Rivet Counter line model include Canadian Pacific (as shown in six road numbers, with the Lord Strathcona's Horse logo in one number), Citirail (gray, blue, and yellow in three numbers), Ferromex (red, white, and green in four numbers), Norfolk Southern (as-delivered in two numbers; Interstate RR, pre-1982 Norfolk Southern, Pennsylvania RR, and Southern Ry. heritage units in one number each), and Union Pacific (Armour Yellow and Harbor Mist Gray with "Building America" logo designated in six numbers, with "5,000th ES44" logo in one number). Direct-current models with a 21-pin connector are $194.99. Versions with an ESU LokSound 5 sound decoder, dual cube-type speakers, and two super capacitors are $284.99. ScaleTrains, 844-987-2469, scaletrains.com

N scale

CANADIEN
NATIONAL
CNLX 7046
CN

3,800-cubic-foot capacity cylindrical hopper. Prairie Shadows offers this model in multiple paint schemes, including Canadian National (gray with "wet noodle" herald and CNLX reporting marks, gray with website and black herald, gray with red "wet noodle" herald, and rainbow scheme), Canpotex (gray), Canadian Pacific (black, script and Multimark schemes), and Procor (gray with "Flying P" logo). The injection-molded plastic model has see-through etched-metal running boards, 100-ton trucks with metal wheels, and body-mounted Micro-Trains couplers. The N scale hopper is priced at $29.99. Prairie Shadows, 204-803-7448, prairieshadows.com

lease); Dunbar Molasses New Orleans (black, 1919+ in two numbers); Union Starch & Refining (red, 1950+); Spokane, Portland & Seattle (1964+ water service car and 1972+ BN era MOW car in one number each), North American (black, 1964 lease with VENX reporting marks in four numbers), and Union Tank Car (black repaint, 1948+ in 12 numbers). Six numbers per scheme unless noted. Radial course tank body, wire grab irons and uncoupling levers, KC- or AB-brake variations, CNC-machined 33" metal wheelsets, and Kadee scale couplers. $46.95. Tangent Scale Models, 828-412-3886, tangentscalemodels.com



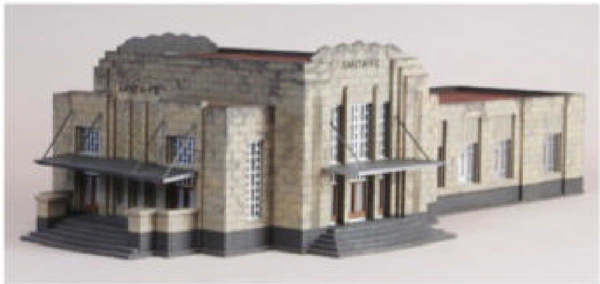
- **Gunderson Multi-Max auto rack.** BNSF Ry. (orange in six road numbers), Canadian National (yellow with white "wet noodle" herald), Canadian Pacific (yellow with beaver herald), CSX (yellow with "boxcar" herald), Kansas City Southern (white), Norfolk Southern (yellow with Thoroughbred herald and TOCX reporting marks on flatcar), and Union Pacific (yellow with "Building America" slogan in six road numbers). All flatcars feature TTGX marks unless noted. Three numbers per scheme unless noted. Later body type with late end doors and molded corrugated side panels. Detail kit available separately with door rods, metal grab irons, uncoupling levers, trainline hoses, and more.

Operator line. $46.99. ScaleTrains, 844-987-2467, scaletrains.com

VIRGINIAN & OHIO
V&O

- **R-70-15 refrigerator car.** Virginian & Ohio (orange and blue with white roof) and Sun Belt System (white with yellow, orange, and maroon markings). Six road numbers per scheme. Etched-metal side screens and roofwalk supports; separate, factory-applied ladders; 33" metal wheelsets; and metal knuckle couplers. $50. Produced by InterMountain Railway Co., available from Three Notch Rail, threenotchrail.blogspot.com

HO scale structures



- **Atchison, Topeka & Santa Fe depot.** Kit features laser-cut acrylic parts. Based on an art deco-style depot served by the *Texas Chief*. Includes main building and annex for Railway Express Agency or freight, and blank walls without Santa Fe lettering. Measures 21"x 11" x 6". $195. Custom Model Railroads, 410-889-0010, cmrtrain.com

Club offerings

NW
170768
Norfolk and Western

- **Norfolk & Western HC-46 American Car & Foundry 2-bay covered hopper.** Accurail HO scale kit produced for the Cincinnati Division of the National Model Railroad Association. Three road numbers. Single car, $25; three-pack, $70. Shipping for one car, $9.45; two to three cars, $17.10. Ohio residents add 7.8% sales tax. Cincinnati Division 7 Car Projects, c/o Paul Maciulewicz, 9151 Congress Court, West Chester, OH 45069.

HO scale vehicles

4530
CONRAIL

- **Yard tractor.** Conrail (yellow with blue-and-white herald); Atchison, Topeka & Santa Fe (white with blue lettering); J.B. Hunt (white with yellow-and-black logo); Norfolk Southern (white with black herald); Southern Pacific (white with red "speed" lettering); and United Parcel Service (white with modern logo). One cab number per scheme. Separate, factory-applied details; cab interior; rubber tires; photo-etched metal steps and rear deck; clear window glazing; and adjustable fifth wheel height. $29.99 (add $3 for UPS). Athearn Trains, 800-338-4639, athearn.com

N scale freight cars

SFRD
SuperChief

- **Atchison, Topeka & Santa Fe mechanical reefer.** Class RR-56 (*Chief*,

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HO scale
1978
A.T.&S.F.

2-8-0 Consolidation steam locomotive. This HO scale model from Broadway Limited is in hobby shops now. The 2-8-0 Consolidation ($549.99) is decorated for Atchison, Topeka & Santa Fe; Bangor and Aroostook; Canadian National, Canadian Pacific; Central of Georgia; Chesapeake & Ohio; Chicago & Alton; Great Northern; Lake Superior & Ishpeming; Seaboard Air Line; Southern Ry. (two paint schemes); Toronto, Hamilton & Buffalo; Union Pacific; and Western Maryland. The steam locomotive is also available painted black but unlettered. Features on the 2-8-0 include a dual-mode Paragon4 sound decoder with Rolling Thunder and a die-cast metal boiler, tender body, and chassis. Broadway Limited Imports, 386-673-8900, broadway-limited.com

El Capitan, *San Francisco Chief*, Santa Fe All the Way, *Super Chief*, and *Texas Chief* slogans), RR-60 (*San Francisco Chief* and Santa Fe All the Way slogans), and RR-61 (*San Francisco Chief* and Santa Fe All the Way slogans). Injection-molded plastic model with separate, factory-applied door posts, door latches, and uncoupling levers; detailed underframe including piping, refrigeration, and brake equipment; cushion draft gear detail; two styles of roof hatches (open and closed); see-through side grills; and Trane diesel generator included. Single car, $41.95; four-pack, $167.80. Rapido Trains Inc., 905-474-3314, rapidotrains.com

N scale vehicles

- **Ford F-250 and F-350 pickup trucks.** Burlington Northern (green), Amtrak (white with arrow herald), Canadian National (white with red "wet noodle" herald), CSX (white with blue "Quality in Motion" slogan), and Southern Pacific (white). Also available painted safety yellow and white. Prototypical trim packages for XL and XLT trucks, interior detail, semi-detailed chassis, and clear window glazing. Two-pack, $32.95. Atlas Model Railroad Co., 908-678-0880, shop.atlasrr.com MR

X4014
4014
UNION PACIFIC
Big Boy
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TRIX

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Also available in a Märklin H0 version (37997) and standard Trix HO version (22014).

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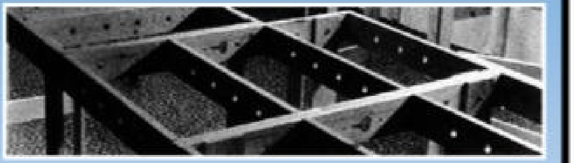

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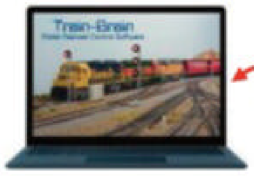

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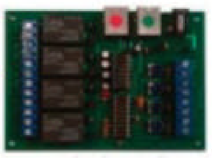

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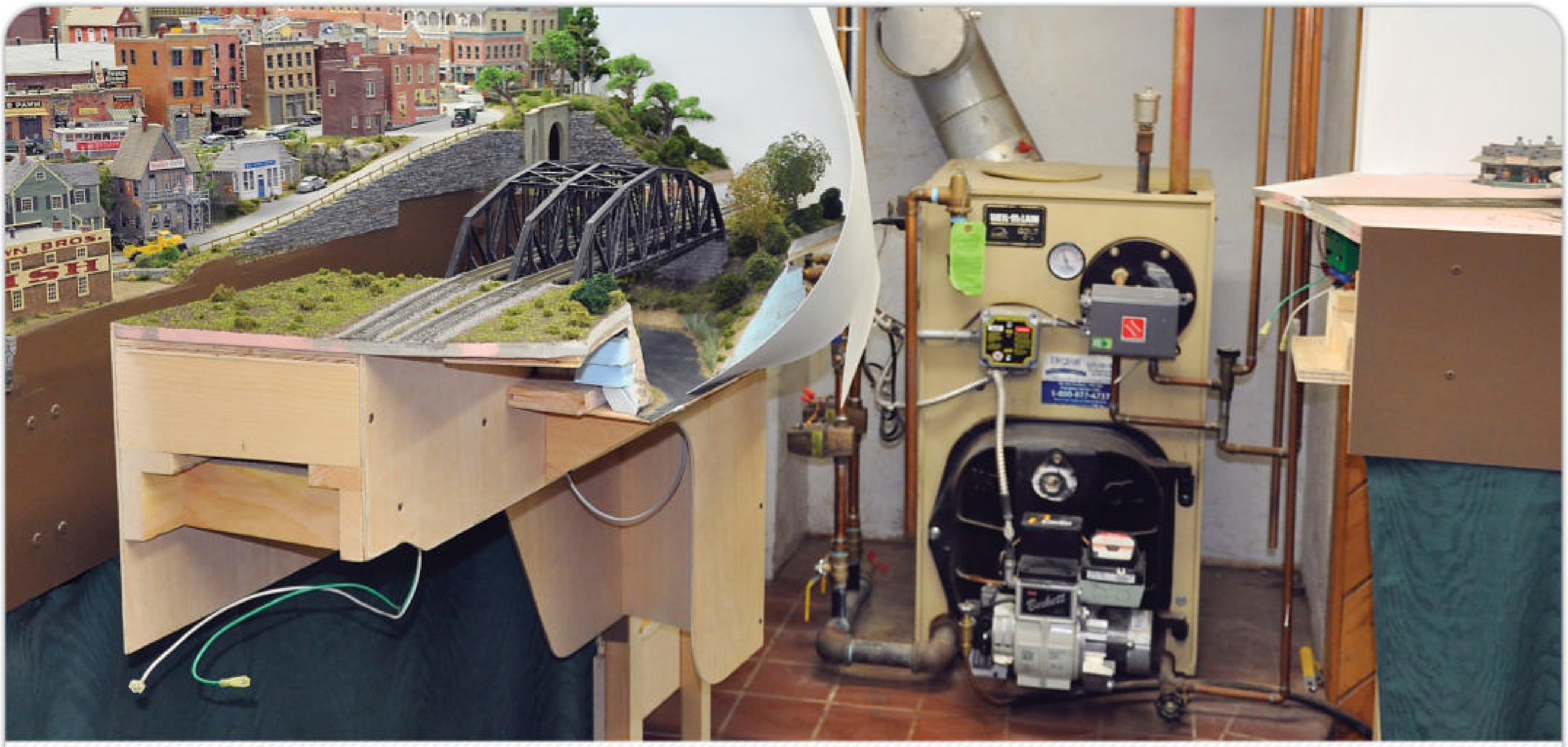

A swing gate stands open on Tom Oxnard's HO scale layout, giving access to the furnace behind it. A swinging, lift-out, lift-up, or drop-down section can likewise give access to the interior of a model railroad. Tom Oxnard photo

How do I build a layout swing gate?

Q On page 45 of the Nov. 2022 issue, a swing gate is shown as part of Mark Carlson's Chicago & North Western layout. It looks like a marvelous way of avoiding duckunders, lift bridges, and other methods of entering an around-the-room layout. Are there any alignment problems or inherent sagging issues of which builders should be aware? Do you know of any articles that cover the bracing considerations, latching and alignment methods, special wiring, etc., that I should be aware of when I build a layout swing gate? What provision should be made to prevent locomotives from running off the edge?

Bruce Penniston, North Gower, Ont.

A We've published a number of stories over the years on various ways to bridge a benchwork gap: swing gates, liftouts, lift-ups, drop-downs, and so on. Each is as unique as the layout situation it solves. Go to the online version of this question at trains.com/mrr/beginners/ask-trains/ for links to several of these articles in our archives.

When you build your layout swing gate, bridge, or removable section, here are some issues you need to concern yourself with:

• **Rigidity.** You can't have your gate sagging or drooping under its own weight, or the ends won't align. Use more, and bigger, cross-braces than you think you need. Consider adding guy wires with turnbuckles, like those used to support old screen doors or garden gates, to adjust your gate if needed.

• **Shrinkage.** Wood shrinks as it dries over the course of years. A gate that fits snugly when it's built may become loose as time goes on, pulling rails out of alignment. If you can, build your gate out of more dimensionally stable wood products like medium density fiberboard (MDF) or oriented strand board (OSB), or aged lumber that's been in your basement for a few years.

• **Rail alignment.** A good technique to keep rail ends aligned across the gaps is to solder them to copper-clad printed-circuit board (PCB) on both sides of the gap, then cut the rails with a rotary tool after they're secure. (Be sure to gap the copper surface of the PCB so as not to create a short!) But even that might shift if your lumber shrinks. Fix the PCB to your benchwork with screws threaded through slots in the PCB. That way, if the gate or the benchwork changes size, you can loosen the screws and adjust their alignment. Gerry Leone offers another solution for this issue in his article "Aligning track on moveable benchwork" in our August 2016 issue.

• **Protecting your trains.** If you run your trains with direct current, all you need is a simple electrical switch that's closed when the gate is closed and cuts off current to the tracks approaching the gate when it's open. But many Digital Command Control-equipped locomotives these days come with "stay-alive" capacitors that would let a train run through that dead track and right over the edge. Consider adding a physical stopper, like an under-layout switch motor that automatically raises a stiff wire between the rails before the drop-off point.

By Steven Otte

Q Is using bottled gas as airbrush propellant better than my air compressor? And what kind of gas should I use: CO_2, nitrogen, something else?

Joseph Zawoiski

A Since you already have an air compressor, I would keep using that. A compressor, equipped with a regulator and a moisture trap, is the best air source for airbrushing. It will provide a steady stream of moisture-free air at the pressure you need and will never run out. The best compressor is the kind with a built-in air tank, because the compressor will only run when the pressure in the tank drops. Not only does this prevent the "pulsing" effect that can result from running an airbrush directly from a compressor, it also spares your ears all that noise. You can get one for less than $200 from Paasche, Tamiya, and others.

That being said, using bottled gas as airbrush propellant is a close second choice. It's silent, and you can still use a regulator and moisture trap to provide a quality air stream. You can buy a relatively inexpensive air bottle similar to that used by scuba divers that you can refill with your own compressor or at a service station. However, the air will run out rather quickly, and you'll get tired of schlepping the heavy bottle back and forth to the recharge point.

Introductory Size
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Airbrush
Propellant

Canned aerosol propellant is an option we recommend only for infrequent airbrush users. If you're replacing the can frequently, it can get expensive. Plus, you can't regulate the pressure from a can. Robert Downie photo

An alternative is a high-pressure gas bottle. You can get bottles of carbon dioxide gas (CO_2) from welder's supply shops. They will provide clean, moisture-free air, and last a lot longer than an air tank you fill yourself. However, high-pressure tanks are much more expensive than a regular air tank, and getting them refilled is also pricier.

The third option is commercial canned propellant sold by airbrush makers like Testor Corp. We recommend this only for beginners and infrequent hobbyists. The cans run out pretty quickly, so the price adds up fast if you use your airbrush a lot. You also can't regulate the pressure from a can, so your airbrush's performance will vary. My first airbrush came with canned air, and its performance almost put me off airbrushes entirely. It wasn't until I came to *Model Railroader* and started using the spray booth in our workshop that I realized what I was missing out on. Don't skimp on the source of air for your airbrush. Its quality is as important as that of your paint or your airbrush itself.

Q I'm thinking of purchasing a new resistance soldering unit. The slip switches on my layout are too close to each other to remove any plastic ties before soldering the rail joiners to the rails. What brand of RSU do you recommend? What should be its 120 volt wattage rating? What type of tip, carbon plier or stainless steel tweezer, should be used for HO scale soldering?

Bert Chu

A According to our resident electronics expert, Allan Gartner, the brand doesn't matter all that much; the power rating does. You need a unit with enough wattage to get the soldering job done quickly, before the ties have a chance to melt. Allan recommends a unit with 85W or more. And for fine soldering like

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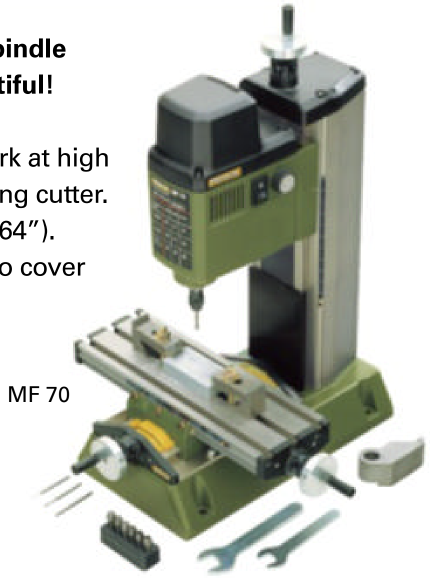

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rail joiners, a tweezer tip is best. To read Allan's DCC Currents column about resistance soldering, see the June 2021 *Model Railroader.*

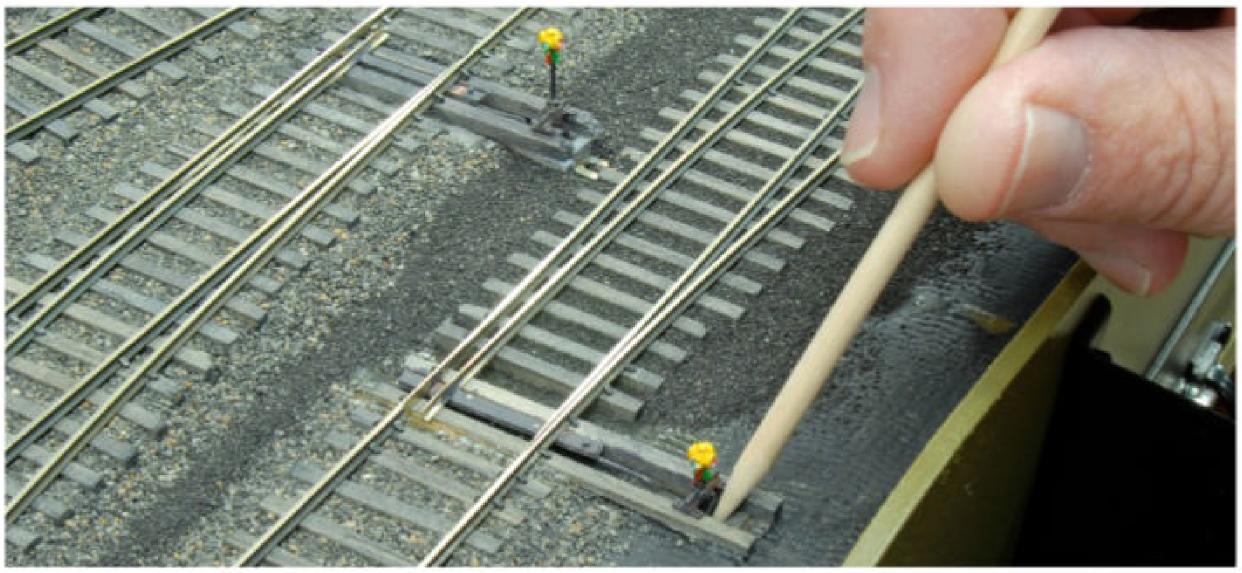
Q I want to use Tony Koester's method to control a turnout with a slide switch. Do you know if he powers the frog with this switch or just moves the points? If he uses it to power the frog, how is it wired?

Don DeLay

A This idea has been around for a long time, and lots of modelers use it, including Tony's friend Perry Squier. Perry's layout is the scene of the photo at right, which shows how Perry glues NJ International switch stands to the headblocks of his turnouts to disguise the switch. But you can still see in the photo the piano-wire linkage between the electrical switch and the switch rod.

The photo came from an article Tony wrote for our July 2017 issue, which includes lots of helpful tips on improving track and turnouts. But in that article, he doesn't discuss how he wires the slide switch to power the frog. For that, look to Larry Puckett's "DCC Corner" column in our December 2015 issue.

The switch is a single-pole double-throw (SPDT), which connects either of two outer poles to the center pole. The center pole is wired to the frog, and the two outer poles go to the two track power bus wires. Be sure that you pay attention to which direction the switch will move the points. This will determine which power bus to connect to which side of the slide switch.



Like his friend and fellow HO scale modeler Tony Koester, Perry Squier uses single-pole double-throw slide switches to control his turnouts. Piano wire links the switch to the throw bar and the switch powers the frog. Tony Koester photo

Q I want to get back into model railroading, but I don't know whether to go with HO or N scale. Please give me the pros and cons of each.

John Sala

A Choosing a modeling scale is one of the most consequential decisions a modeler faces, right up there with era, locale, and prototype. It's also a very subjective choice. While both HO scale (1:87.1) and N scale (1:160, about half the size of HO) have their advantages and limitations, it's entirely up to you to decide how important each of these factors are. When choosing a modeling scale, you'll have to think about what aspects of the hobby you most enjoy, what you want out of your layout, and your current and future modeling ability.

How much space do you have for your layout? If you have a basement or sizable spare room, you have a choice. But if your space is limited, you might find it hard to fit the railroad you want in HO scale. You can fit more railroad in less space in N.

Would you rather run a local freight or a long unit train? Since HO scale models are physically larger, unless you've got a lot of space for your layout, you'll be better off running shorter trains in HO. N scale is great for running long trains, which need long passing sidings. On the other hand, it's easier in HO scale to do all the coupling and uncoupling local switching calls for.

Do you want DCC sound? While locomotives with sound are available in both scales, smaller locomotives, like switchers, often don't have space for a speaker in N scale. And those that do have speakers don't produce low bass tones as well as the larger speakers in HO scale engines. If sound is important to you, lean toward HO.

How much do you enjoy detailing? Not just locomotives and rolling stock, but structures, scenery, figures, and more. Not only is it easier to do the work of detailing in HO scale, it's also easier to see the detail – which makes it more obvious when something is not well done. N scale is better for "big picture" modelers. If you want to superdetail in N scale, you'll need good eyes, steady hands, and a lot of patience.

How about scratchbuilding and kitbashing? There are a lot of great products available in N scale, but nowhere near as many as in HO. If you go for N scale, you'll have a smaller selection of structures, rolling stock, and scenery, so you may have to turn to kitbashing and scratchbuilding more.

Do you want urban or rural scenery? For realistic mountains, prairies, and cliff faces, you can't beat 1:160. N scale trains look great snaking through broad scenic vistas that dwarf the trains. But if your plans include a big city scene, you're going to spend a lot more in both time and money filling up that space with structures in N scale. Since HO structures are bigger, you can build a convincing city with fewer of them.

Speaking of structures, what's your philosophy on selective compression? That's where structures are built to resemble the prototype buildings, but key dimensions are shrunk by omitting a loading door here or a row of windows there. If you want your industries to look big enough to actually warrant rail service, go for N scale. If you don't have a problem with selective compression, background flats, and similar space-saving tricks, HO scale works.

Do you think you'd ever want to try handlaying track? It can be done in both scales, but believe me, it's easier in HO.

Finally, if I may ask, how old are you? How good is your eyesight and how steady are your hands? If you're confident in your ability to model in N scale now, go for it, but face it – as time goes on, your vision and dexterity aren't going to get better. We're all on a one-way trip. If you foresee fine work getting difficult not too many years down the road, choose HO … or even S or O.

Send questions to senior associate editor Steven Otte at AskTrains@Trains.com.

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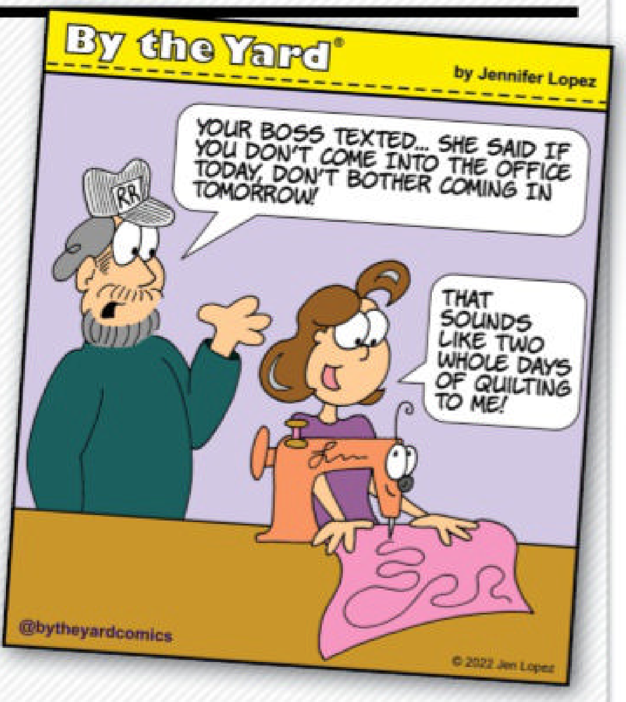
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I'm an N scale model railroader, and I've really enjoyed Jennifer Lopez's "By the Yard" comic that you've been running recently. My wife is a quilter, and on a recent vacation, I dropped her off at a quilt store and went to check out a model railroad shop. When I went back to the quilt store to get my wife, I was surprised to see a calendar there with the same comic characters poking fun at quilters.

If you are married to a quilter, the comics in *Model Railroader* are only half of the humor. The double meaning of the comic title "By the Yard" is ingenious. Jennifer Lopez captures funny quirks of both model railroaders and quilters, as well as the way they relate to each other when living in the same house together. I'd love to see you interview her on video.

Lee Williams, Oklahoma City, Okla.

(Editor's note: We're working on that. Stay tuned!)

How good is good enough?

Eric White asked a very good question in his editorial in the December issue ("When is your realism level good enough?"), which coincidentally I read less than an hour after hearing of Allen McClelland's passing.

My own realism level is when the overall scene looks plausible, and not a model railroader's take on modeling what other people have modeled. There's far too much derivative modeling in the hobby as it is, and I've always aimed to model what just "looks right" overall in a scene. I also don't bother to model things people cannot see, such as the underside of rolling stock where the detail will not be seen by someone normally.

Otherwise, my yardstick is simply to look over any scene and ask myself if it would look right in the real world for my layout's concept of the Blue Ridge area of Tennessee in 1943. If I can't say yes to that question, then changes get made.

My layout isn't superdetailed by my standards, though recent visitors said they considered it so. As they always say, your mileage may vary.

Lee Bishop, Rochester, Wash.

A good topic in December's editorial. As you note, "good enough" will be different for each modeler. However, I think it's important to challenge yourself once in a while. In a train made up of good enough models, one or two that stand out allow the modeler to point to them and say, "I did that." I think that's where the National Model Railroad Association's Achievement Program comes into play. It isn't about getting awards for your modeling, but challenging your skills and knowledge of the hobby. While not everyone will go for Master Model Railroader, working on one or two AP categories will allow a modeler to challenge themselves and gain recognition for what they achieve. It isn't a contest, rather a personal challenge to raise your skill level, even if you don't apply it to an entire layout.

Greg Williams, Canterbury, N.B.

Not all readers have internet

There are Amish in the hobby of model railroading, too. Amish aren't allowed to have smartphones, and thus I felt rather left out when I saw page 6 in the December MR ("On Trains.com"). A saw-by – what is that? I don't know much about prototype operations, but I'd like to learn as much as I can about it. Since that article is only online, it's not available to me. Another thing is a lot of ads don't have a phone number or an address. That's enough to keep any Amish away from the hobby.

The other thing I don't like is cheating. It should be illegal to take a picture of the prototype and claim it's a model in "Trackside Photos."

But overall, MR is a great magazine. I enjoyed the article on the logging layout. I also admire Lee Marsh's patience. If I took 20 years to build a bridge, I'd be as thin as a sapling and have bloodshot eyes from lack of sleep. I also liked the article on weathering a modern road locomotive. I hope there's an article coming up on weathering a steam locomotive.

Daniel King, Bird-in-Hand, Pa.

Editor's note: No matter how realistic they look, all the pictures published in Trackside Photos are of models.

Not all can see tall layouts, either

In December's "Trains of Thought," Tony Koester advised modelers to consider layout elevations in the 48" to 58" range. However, this can pose problems for people who are short in height, regardless of age, or are reliant on wheelchairs or scooters for mobility. So if a modeler wants his or her layout elevations in the 48" to 58" range, he or she should have some means to accommodate the physically challenged. This can be accomplished by one or more of the following: an arrangement of strategically placed mirrors; furnishing of stepstools or periscopes; or a closed-circuit television system.

Ignacio Metre Mas, Fresno, Calif.

Corrections

The locomotive pictured on page 63 of our November issue is a 2-8-0 Consolidation, not a 2-6-0 Mogul.

The caption on page 19 of *Great Model Railroads 2023* refers to the Canadian National Strathcona Division. Bill Smienk's layout actually models the Canadian Pacific.

Comments, suggestions, and additional information on Model Railroader articles and departments are welcome in this column. Every comment will be read, but not all can be printed or answered. Make your statement in 300 words or less, and send it to **Railway Post Office, Model Railroader magazine, P.O. Box 1612, Waukesha, WI 53187,** or e-mail **editor@modelrailroader.com**. Please include your name, city, and state.

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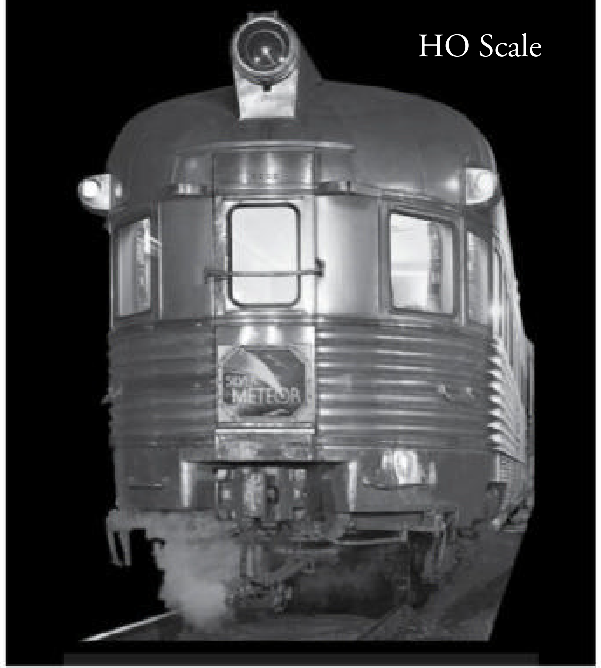

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Locomotive No. 7 spots a flatcar at the turning mill in Kingfield on the Sandy River & Rangeley Lake Railroad. Cheryl Sassi shows how she made tall field grass for the railroad. Photos by Lou Sassi

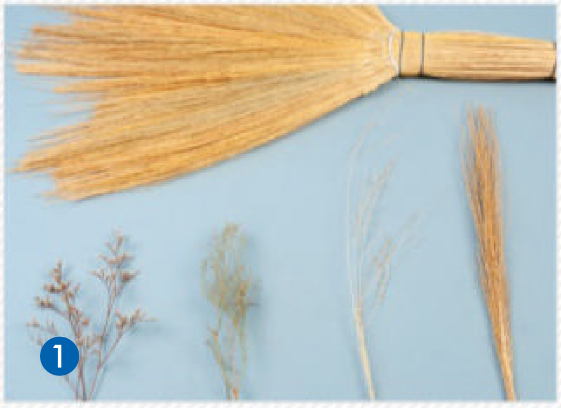
Making tall field grass

One afternoon while touring my husband Lou's O scale Sandy River & Rangeley Lakes RR, I decided to create some low areas of tall grass in the fields around Kingfield and Strong. This would be a fun change from my usual tree- and brush-making activities.

I needed to find material that would replicate grass, and after looking through several drawers of interesting dried stems of various shapes and sizes, I found just the right mix of materials for my project. My husband had purchased these items over several years at a number of small craft stores.

I also decided to use "ground goop" as a surface into which the grasses could be planted. Lou has used ground goop as ground cover for years on both his HO scale West Hoosic Division Railroad and now on his O scale SR&RL. He discussed making and using it in the June 2022 issue of *Model Railroader* and did a "hands on" mixing of it on Trains.com Video. ("Ground Goop" consists of 1 part vermiculite, 1 part Celluclay, 1 part earth-colored latex paint, and ⅔ part white glue. Lou mixes this concoction with tap water until it is the consistency of natural peanut butter or oatmeal.)

STEP 1 TOOLS AND MATERIALS



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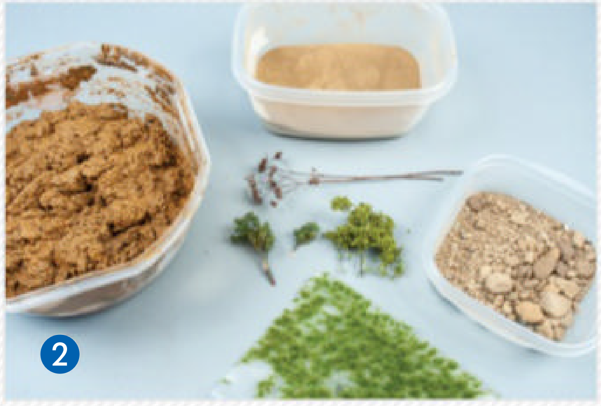

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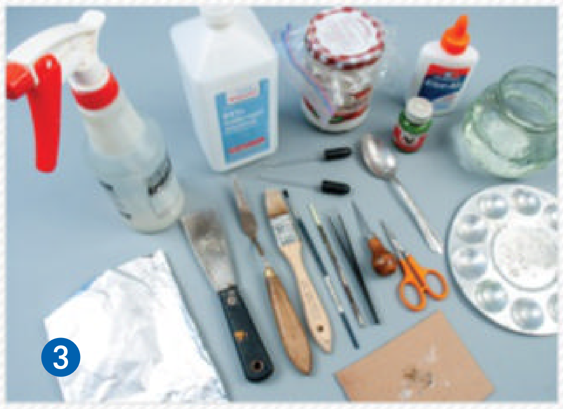


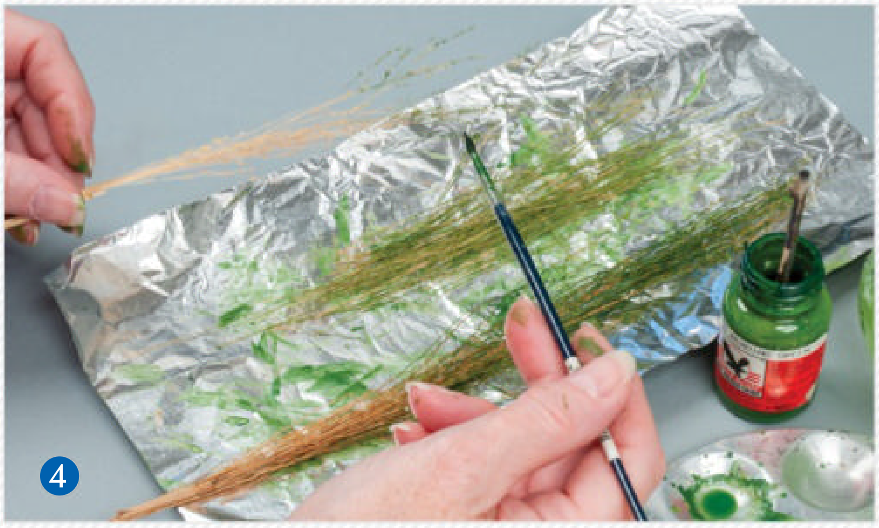
3

In photo ① we see a close-up of the materials I used to represent both heavy twigs and fine high grasses.

In the center of ② are the other items I opted to use to enhance the final scene. They consist of wild oregano, Woodland Scenics Clump Foliage, and small shrubs I made from peppergrass that I painted previously. Also in ② are, clockwise from the top, fine dirt, coarse dirt, Silflor tufts, and ground goop.

The tools I used are in ③. Included are denatured alcohol, diluted white glue (1 part glue to 2 parts water), green paint, full strength white glue, a putty knife, artist's spatula, small soft bristle paintbrush, awl, and scissors.

STEP 2 PREPARING THE GRASS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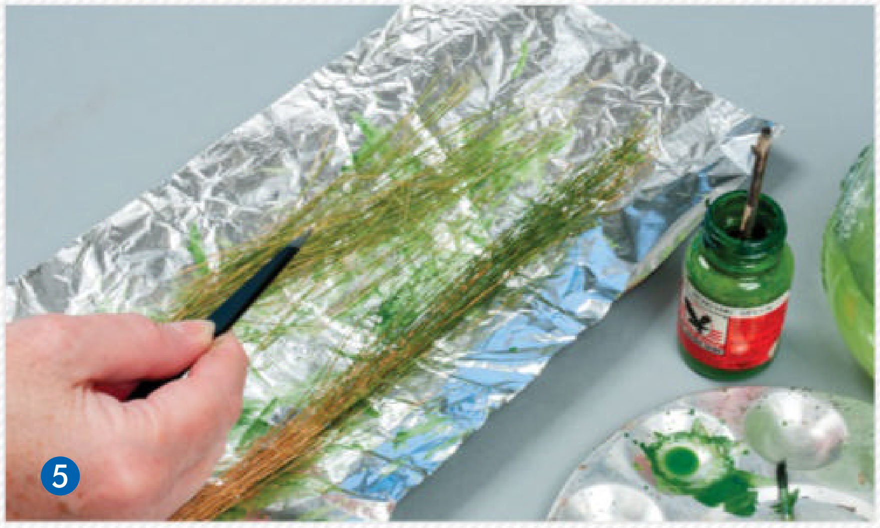
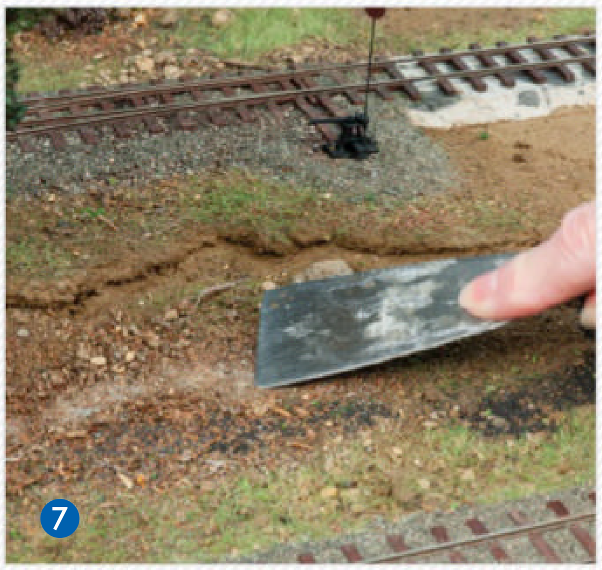

⑤

I laid the various fine grasses on a piece of foil and dry-brushed them with paint, thinned a bit with tap water, being careful not to completely cover the entire surface of the stems ④. During painting, I picked the sprigs up with tweezers and moved them around so they didn't stick to the foil or each other ⑤.

STEP 3 PREPARING THE SURFACE

⑥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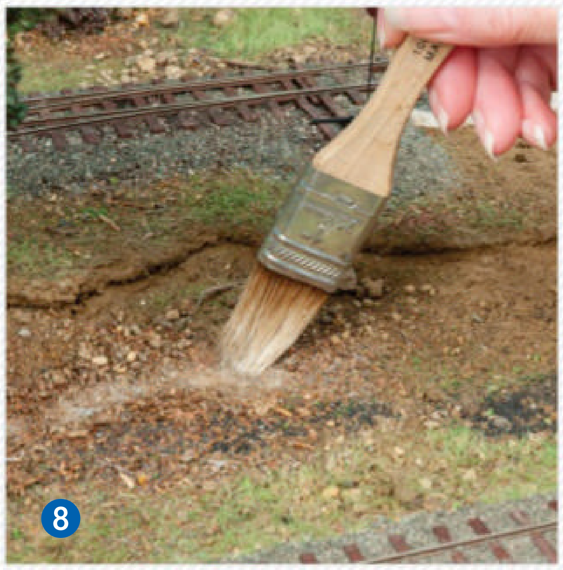
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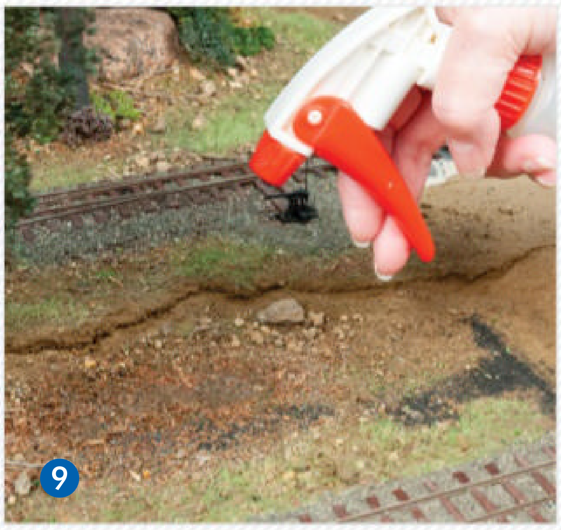
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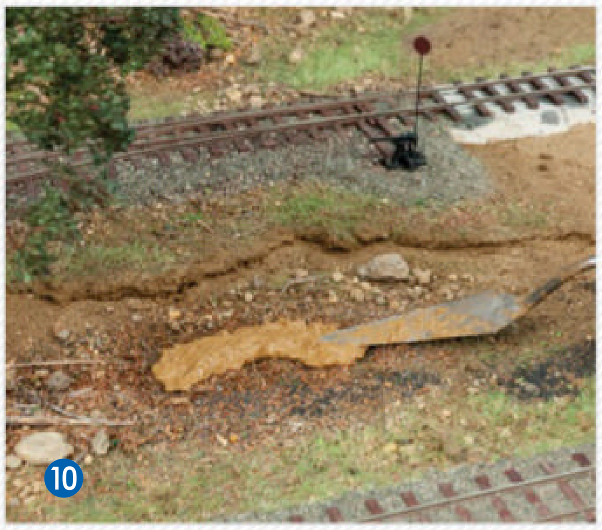
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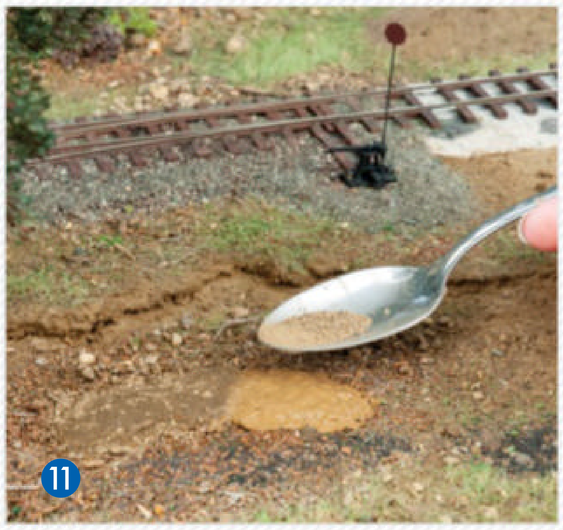
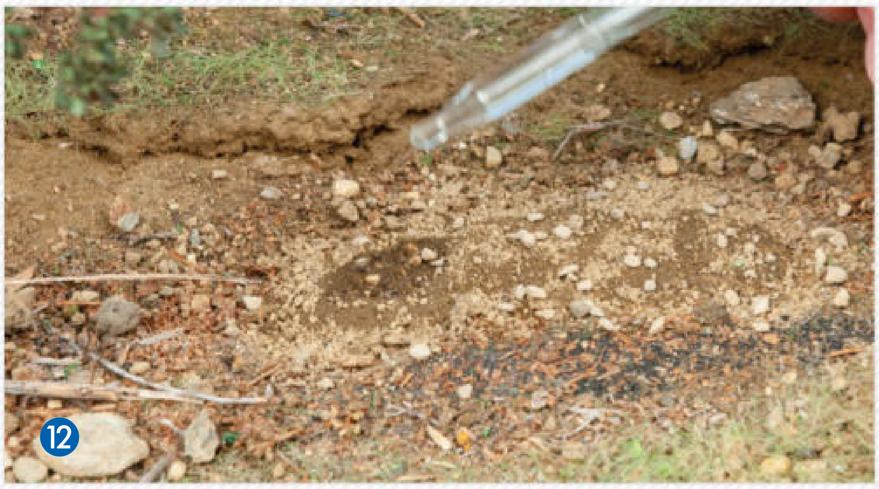

⑪

I decided to add the grass just south of the coaling facility in Kingfield. Photo ⑥ shows the area prior to the addition of the grass. I took everything to the site where they would be planted. After first scraping with a putty knife ⑦ and sweeping away any loose material from the surface of the site with an inexpensive paintbrush ⑧, I wet the area with a spray bottle of tap water so the previously applied goop wouldn't absorb the water from the fresh application. That would cause the new goop to dry too quickly ⑨. I applied the new goop about ⅛" thick with an artist's spatula ⑩. I sprinkled fine dirt onto the goop ⑪, followed by coarse dirt.

STEP 4 APPLYING THE GRASS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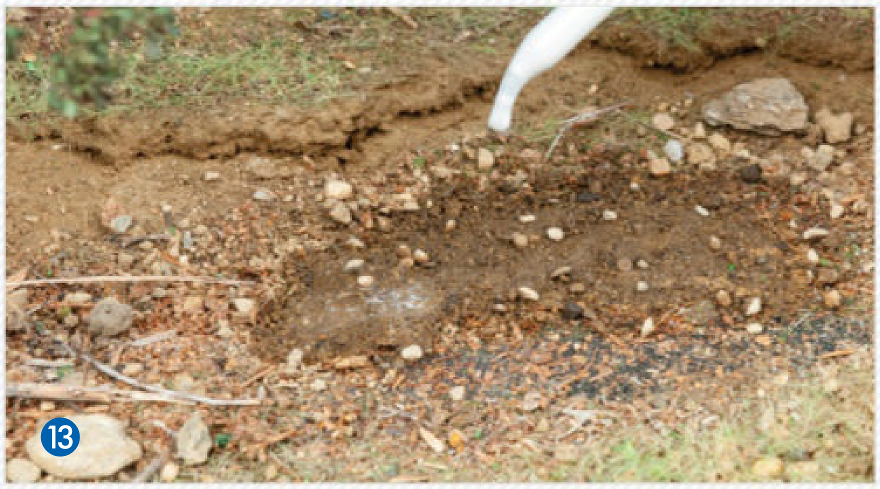
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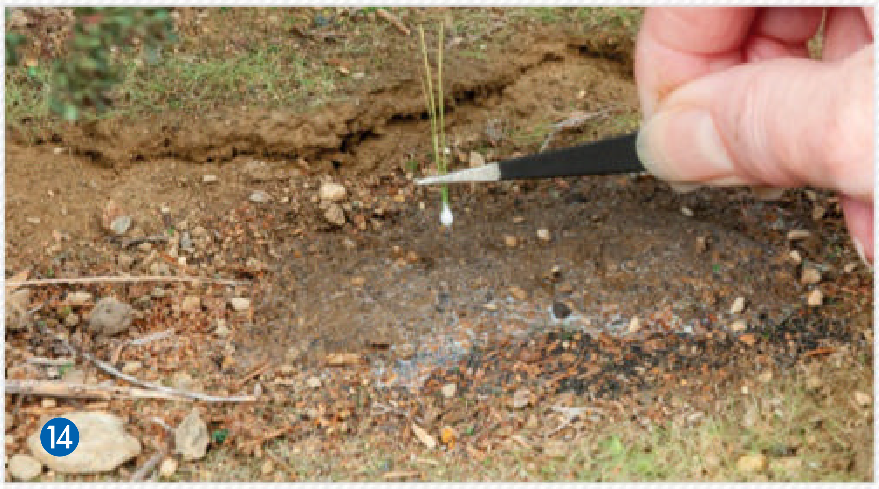
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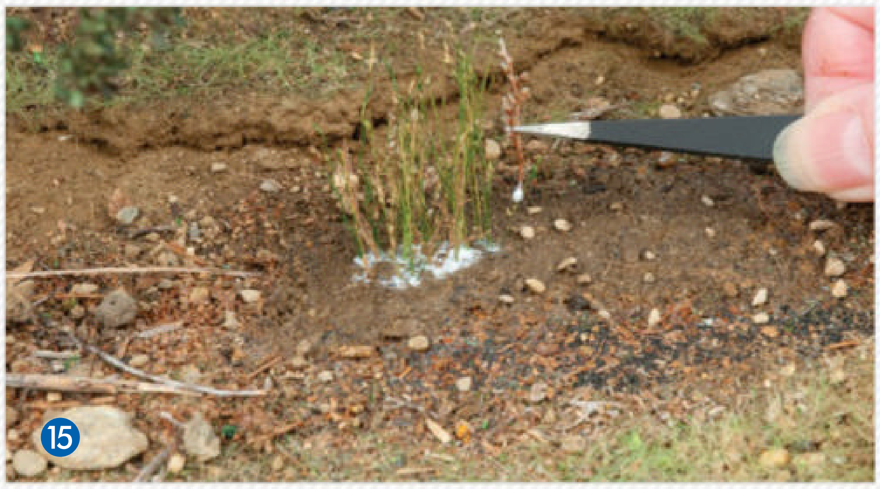
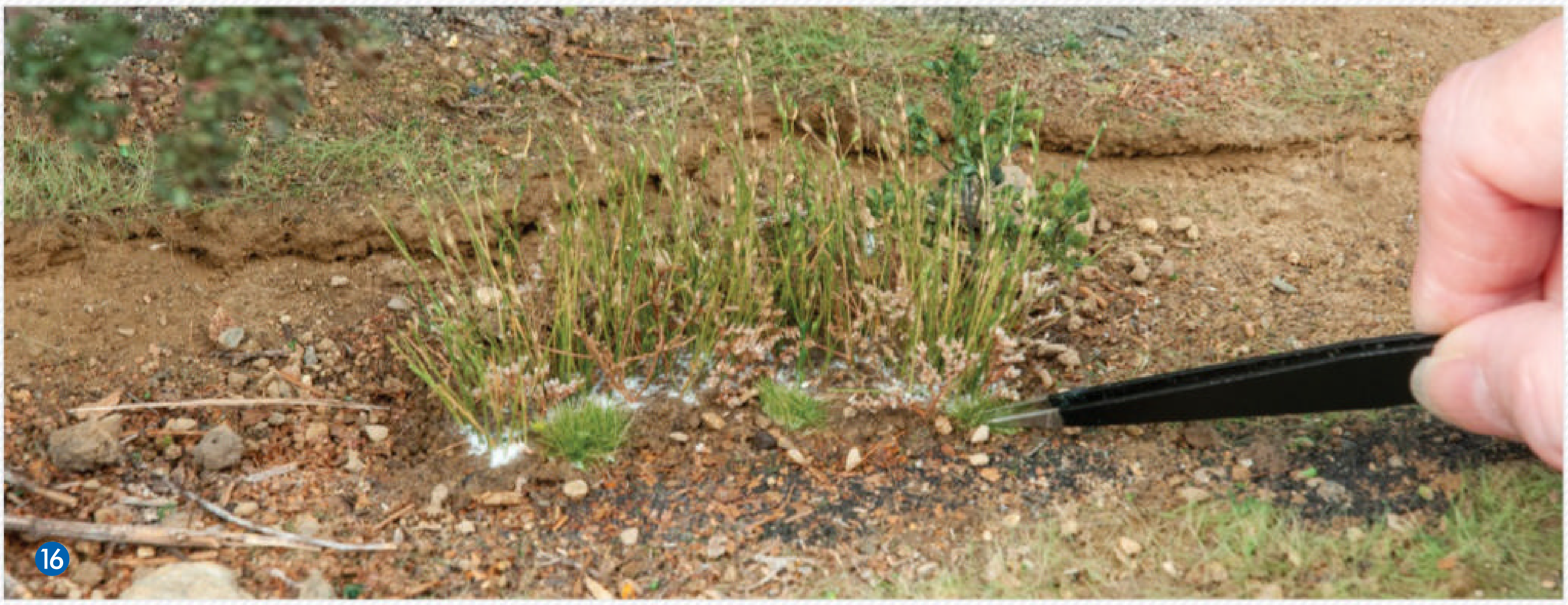

⑮

After patting the dirt into the goop to achieve the right thickness and contours, I used eyedroppers to apply denatured alcohol ⑫, followed by diluted white glue ⑬, to the dirt to fix everything in place.

I cut various grasses to the desired length, dipped them into full strength white glue, and randomly pushed them into the goop ⑭. Every so often I pushed a thicker twig into the goop ⑮. This held the grasses up while drying.

STEP 5 FINISHING TOUCHES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Once I was happy with the look of the high grasses and twigs, I added Silflor Mini-Natur Tufts and Woodland Scenics Clump Foliage around the perimeter of the area to enhance the look and add more texture ⑯. I also added a piece of wild oregano and a small bush made from peppergrass to complete the final scene.

After some evening grass plantings, we now have low areas in fields where the tall grass has taken over.

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San Francisco Streetcar, Car No. 130

This is a model of the original 1914 San Francisco Muni streetcar the "Lucky 130." The four-axel streetcar got its nickname because it was saved from being scrapped in 1958 to tow broken down PCC type streetcars. The streetcar includes an mfx/DCC digital decoder with many light and sound functions, for the first time! Running sounds work in analog. The wheelsets are driven by two Bühler motors.

29911

Norfolk Southern Railroad Rescue Train

This is a model of a NS rescue and training train used to educate and train first responders. The train consists of a diesel locomotive, a tank car and boxcar. The locomotive includes an mfx/DCC decoder for many digitally controlled light and sound functions, and both trucks are driven by two powerful Bühler motors. Running sounds work in analog. The tank car can be filled with water and sprayed using the digitally controlled pump.

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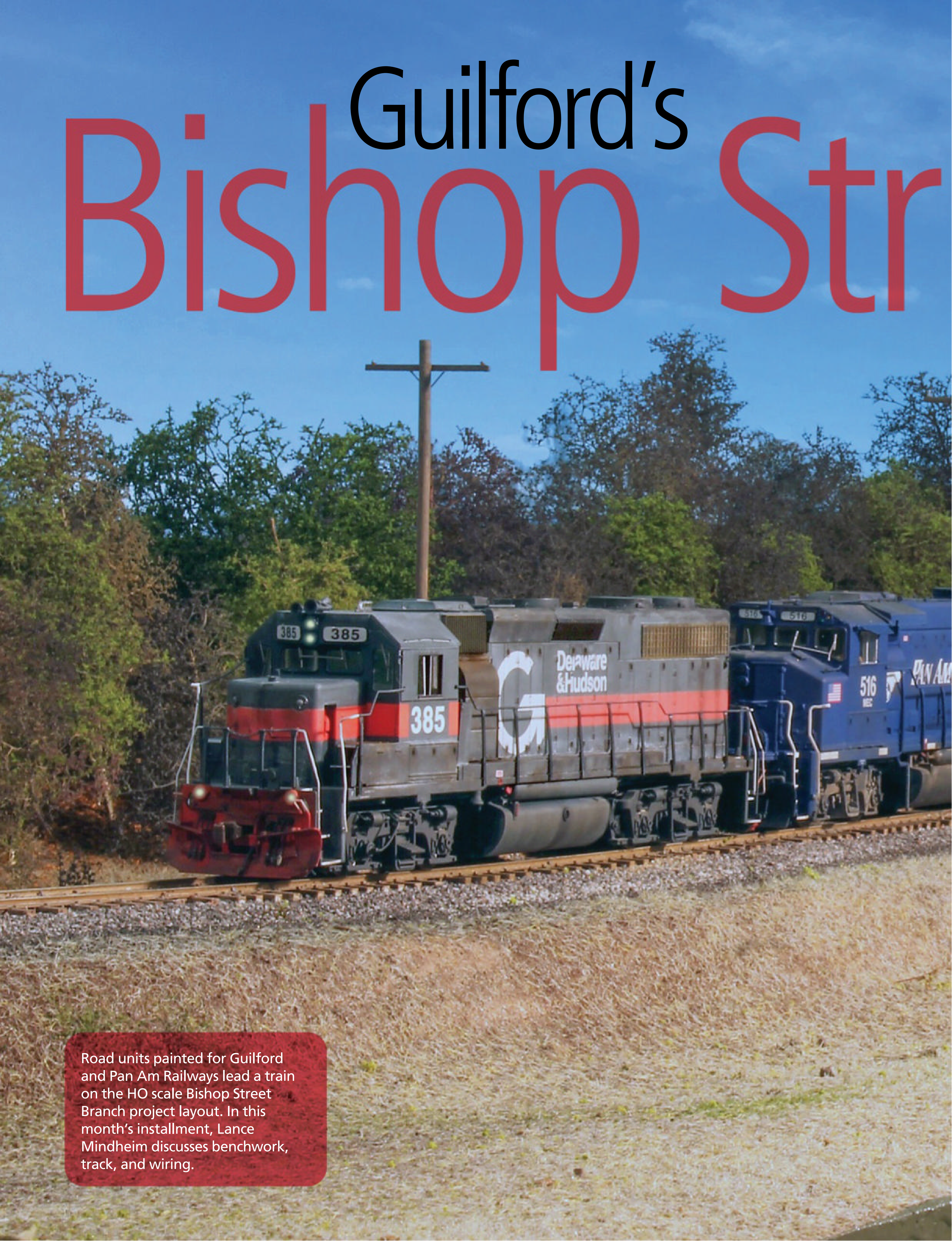
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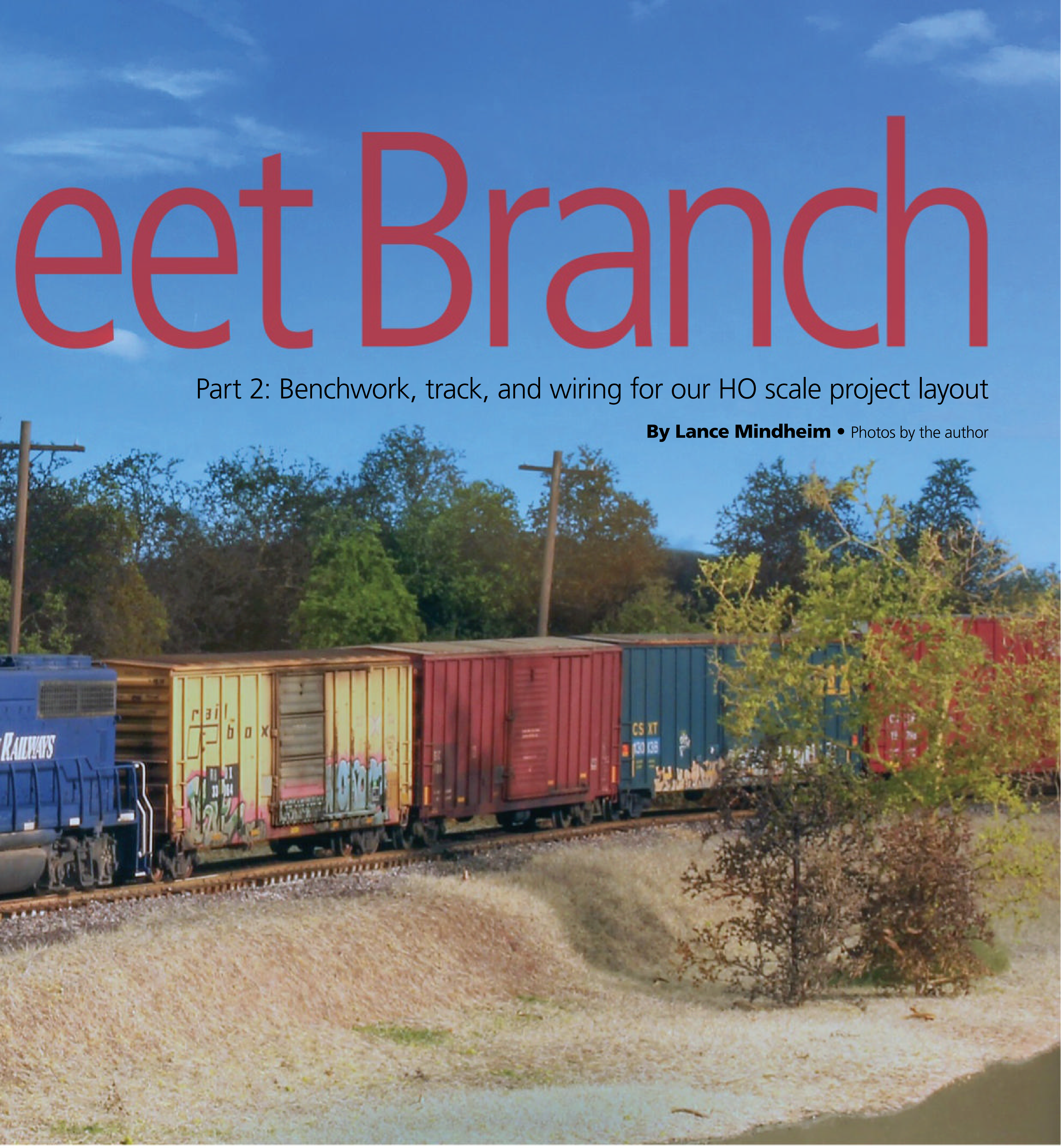
Road units painted for Guilford and Pan Am Railways lead a train on the HO scale Bishop Street Branch project layout. In this month's installment, Lance Mindheim discusses benchwork, track, and wiring.

eet Branch

Part 2: Benchwork, track, and wiring for our HO scale project layout

By Lance Mindheim • Photos by the author

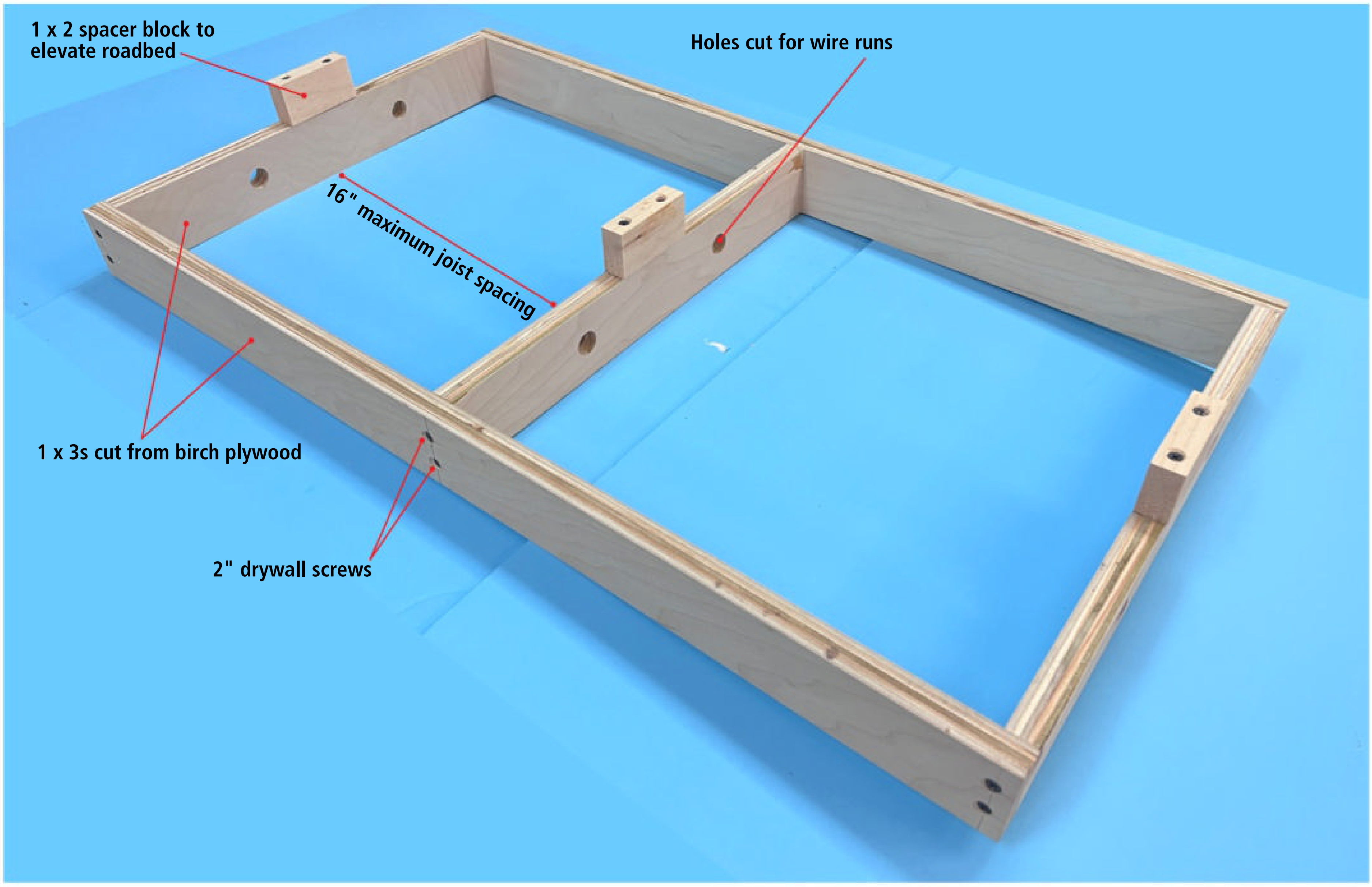


Last month I introduced you to the HO scale Bishop Street Branch, *Model Railroader* magazine's 2023 project layout. Now it's time to roll up our sleeves, get to work, and cover how to build the 10 x 22-foot layout.

Before we get to everybody's favorite subjects, scenery and structures, we need to build the benchwork and work on the mechanical and electrical aspects of the layout, all in a way that's as bulletproof as possible. On the surface it may seem like there are a lot of steps involved. But if you break them into smaller tasks, it makes the layout construction process much more enjoyable.

Building benchwork

There are several basic, tried-and-true benchwork styles. The type doesn't matter as long as it's solidly constructed.


1 x 2 spacer block to elevate roadbed
Holes cut for wire runs
16" maximum joist spacing
1 x 3s cut from birch plywood
2" drywall screws

① **Box girder benchwork.** Lance built this mock-up to show the benchwork for the layout. The joists are spaced no more than 16" apart and have holes drilled in them for running wires.

Because my projects need to be broken down and transported, I use what is called box girder benchwork ①.

The box is typically made of select pine 1 x 3s or 1 x 4s screwed together with 2"-long coarse-thread drywall screws. The spacing for the joists is 16" or less. If the joists are too far apart, they don't provide the necessary support to keep the roadbed from warping or sagging.

As a custom builder, I find streamlining construction methods is important. Going to the big box store and spending hours going through the lumber racks looking for straight boards is time I don't have. Even when you do find straight pieces it's common that a week or so after buying them you find that they've developed warps.

To get around this I had a specialty commercial wood shop cut ¾" birch ply to the size of 1 x 3s, complete with wire pass-through holes in the joists. If you don't have the tools or inclination to make your benchwork you can buy high quality pre-made systems from companies like Sievers (sieversbenchwork.com).

Quick and easy legs

I made the legs for the Bishop Street Branch from select pine 1 x 4s ②. Most people find that a model railroad height of armpit level is the most comfortable, so I cut the leg length to match the customer's height.

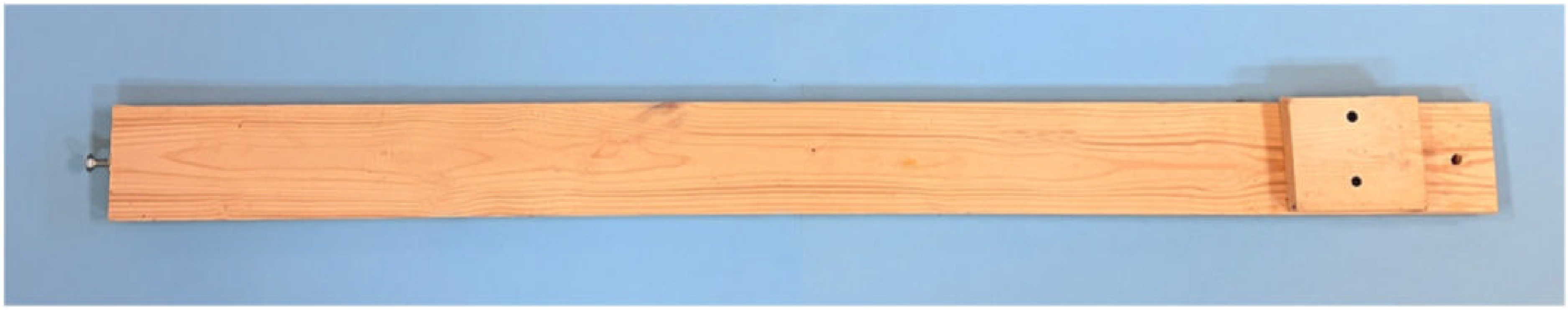
Since few floors are perfectly flat, I added levelers from Sievers to the bottom of the legs ③, opposite. You can also make your own levelers from t-nuts and carriage bolts.

I had a local finishing shop paint the completed legs semi-gloss black. Doing so made a huge difference in terms of how the layout looks the finished room.

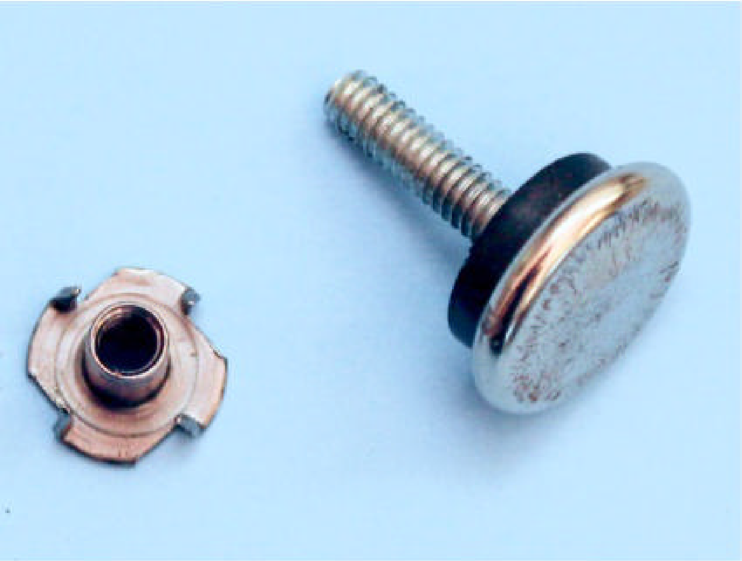
Subroadbed and roadbed

With the benchwork in place, next on the agenda was the subroadbed. I used ½" birch plywood for the Bishop Street Branch ④. I've found the cost of the higher grade material pays for itself both in terms of stability and being easy to mark track locations on.

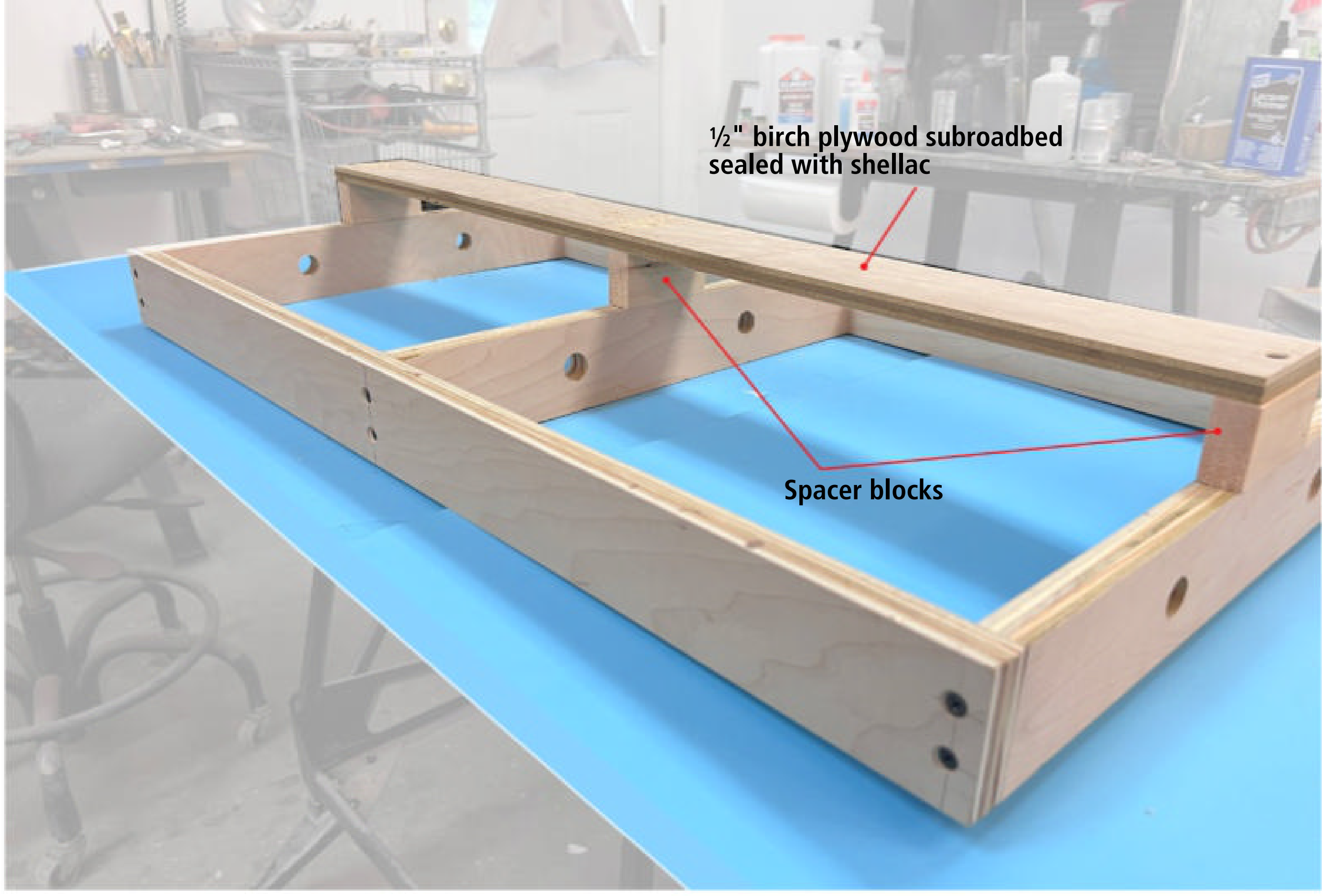
Since I designed the layout, I had the computer-aided design (CAD) file at my



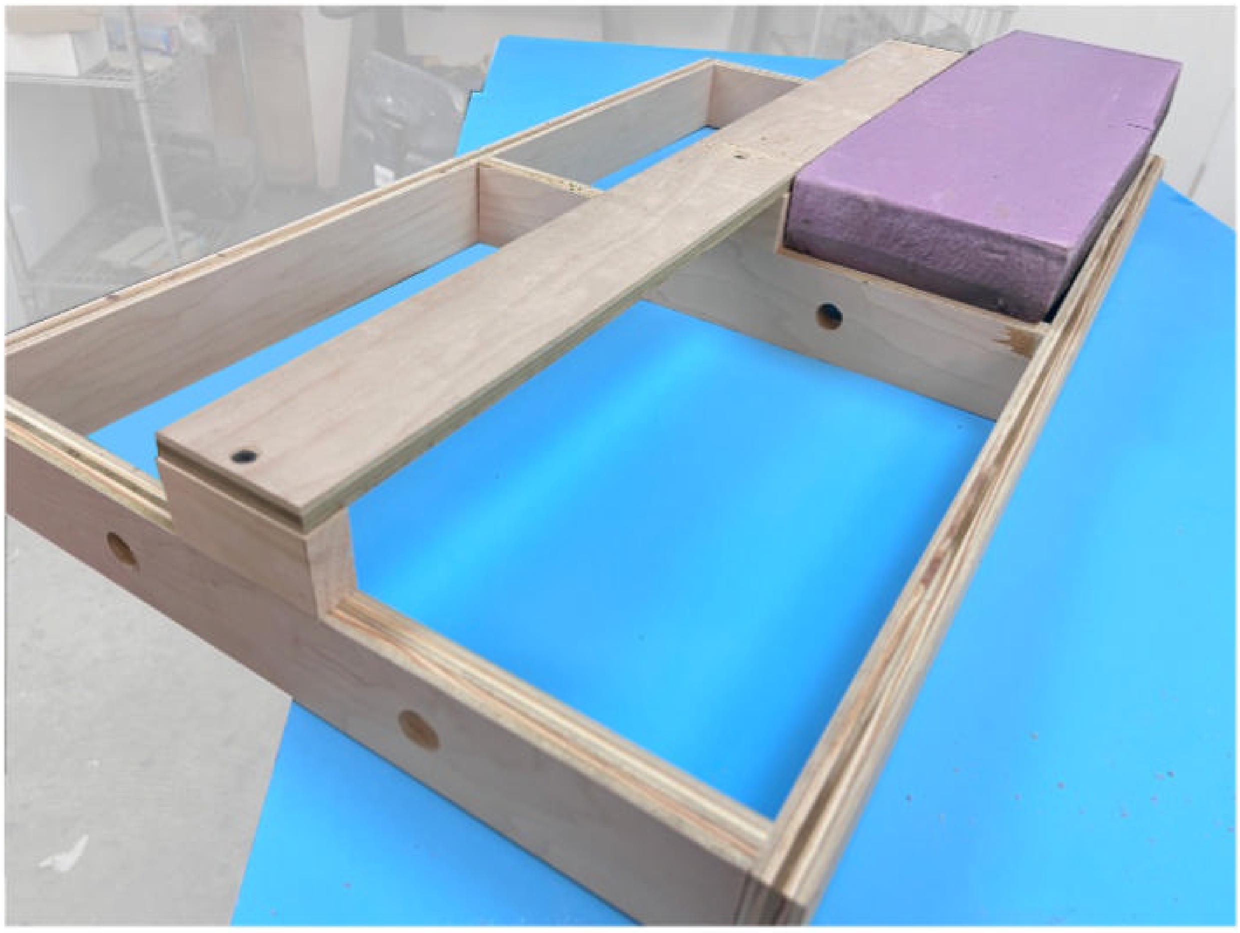
② **Layout legs.** Select pine 1 x 4s were Lance's material of choice when making legs. He later had a finishing shop paint them semi-gloss black to give the model railroad a finished appearance.



③ **Easy leveling.** Lance attached levelers from custom benchwork builder Sievers to the bottom of the legs. T-nuts and carriage bolts could also be used.



④ **Custom work.** Lance had a wood shop cut the ½" birch plywood subroadbed on a CNC machine. He then sealed the plywood with shellac before attaching the subroadbed to the 1 x 2 risers with 1¼" drywall screws.



⑤ **The payoff.** Putting the subroadbed on spacers allows for scenery below track level. Lance used various thicknesses of extruded-foam insulation board, which he shaped with various tools, as the scenery base.

fingertips. I used this file to create a drawing of the subroadbed. Then I submitted the drawing to the wood shop I used earlier. They cut the plywood on a computer numerical control (CNC) machine. When I got the subroadbed pieces back, I sealed them with shellac.

Since most modelers don't have a CNC option available to them, you'll need to purchase sheets of birch plywood, place them over the benchwork, and mark the track locations. A tool called a Rotape compass, available from Micro-Mark (No. 82624), is handy for laying out curves.

Understandably, many modelers are concerned about laying out their track precisely, sometimes going to the length of creating full-size printouts of their designs. In practicality, such precision isn't necessary. Whether a track is ½" or ¾" one way or the other won't impact things much. If you keep your parallel track centers in the 2" range (HO scale) and stick to your minimum radius, you'll be fine. Your mental energies are far better directed toward smooth-flowing trackwork.

I'm often asked if you can lay plywood directly on the benchwork. You can, but doing so gives no room for scenery below track level. Instead, I put small spacer blocks between the benchwork and plywood to elevate it slightly ⑤. For roadbed I use HO scale cork attached to the plywood with wood glue ⑥ (next page). I typically use N scale cork on branch line and industrial track.

Tracklaying tips

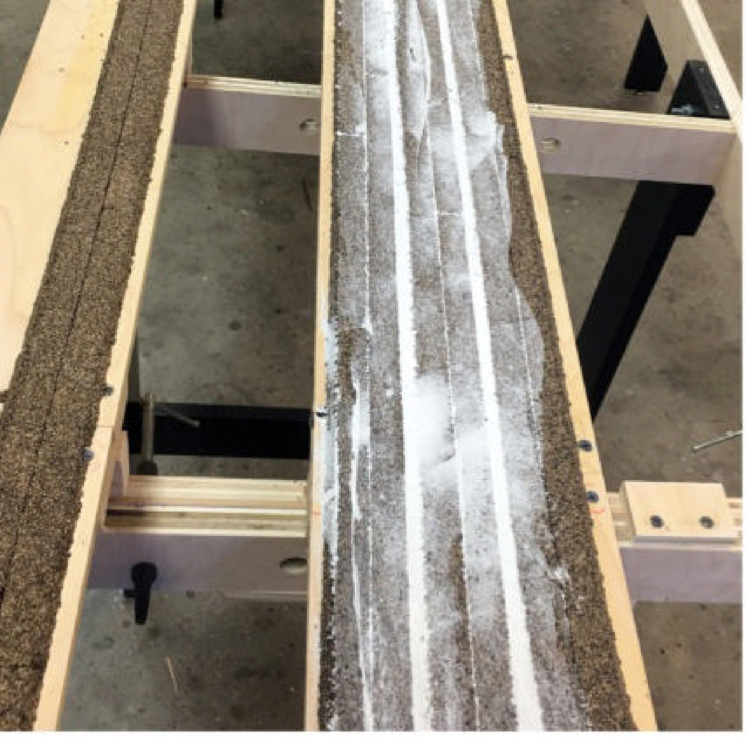
Tracklaying is the most important step of model railroad construction and the one that deserves the most attention. I use a few standards to ensure reliability. Turnouts are number 6 or larger. Parallel track spacing is 2". That said, if you have parallel tracks on a curve, you'll want to increase the spacing to 2½" at the apex to prevent cars from sideswiping ⑦.

From a train dynamics perspective, I don't like having curved track go directly into a turnout. Instead, I insert a 4" to 6" straight section to make a smoother transition ⑧.

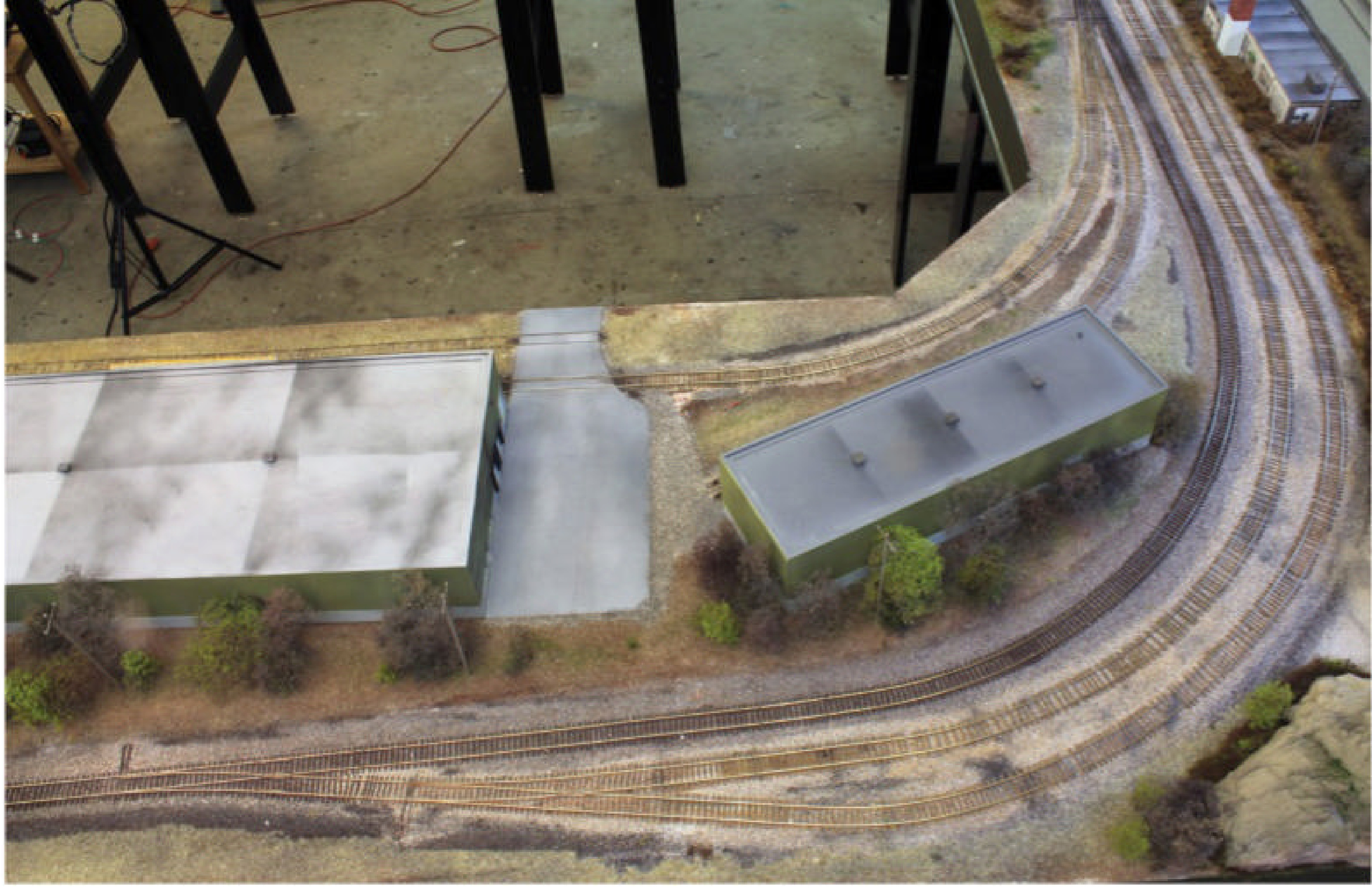
I glue the track to the cork with ordinary white glue. Unlike permanent adhesives, white glue gives you the flexibility to go back and make small alignment adjustments later. All you have to do is wet it with rubbing alcohol and the glue will soften up.

Although it may seem a bit excessive, I also use track nails to attach the track to the cork to prevent future pop-ups. At a minimum I recommend using nails on curved sections.

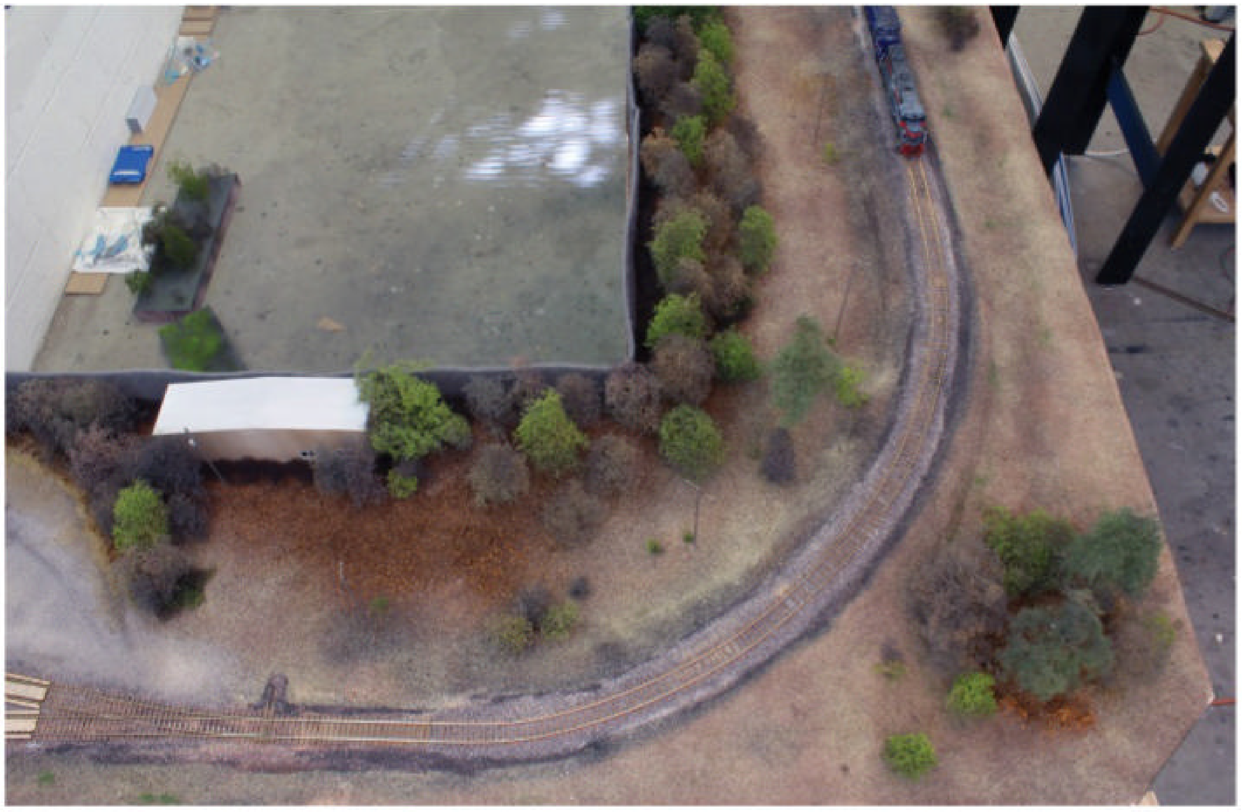
My primary focus during the tracklaying process was allowing for expansion and contraction. I left a 1⁄16" or so gap at every joint or two and didn't



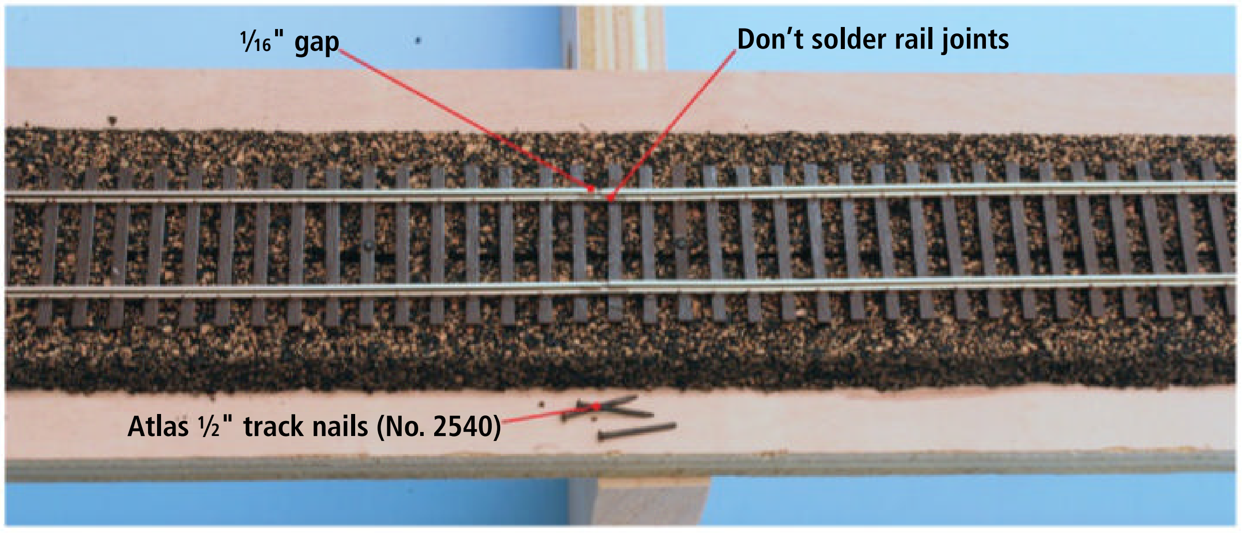
⑥ **Old reliable.** Lance installed cork roadbed on the Bishop Street Branch. This photo, from another project, shows how the roadbed looks prior to tracklaying. The white material is drywall compound, used to fill in gaps between the roadbed in the yard and provide a level surface for ballast.



⑦ **Smooth-flowing track.** Spacing for tangent track in HO scale is 2". That distance needs to be increased to 2½" on curves to prevent cars from sideswiping. Notice also how Lance used contrasting colors of ballast to differentiate the main line (dark gray) from secondary tracks (tan).



⑧ **Better transitions.** Lance doesn't like running curved track directly into a turnout. To improve operational reliability, he places a 4" to 6" piece of straight track between the two, as shown in the lower left of this image.



⑨ **Bulletproof track.** Lance attached the track to the cork roadbed with white glue and Atlas ½" track nails. He left 1⁄16" gaps every joint or two to allow for expansion and contraction. Lance didn't solder the rail joints.

solder the rail joints ⑨. If you don't place the gaps in during construction, it's a pain to go back and add them later. If you end up with a gap that's a bit large, fill it in with styrene.

Depending on the project I'll either use switch machines, manual throws, or a combination of both. I use switch machines for customers who are primarily railfans. For operations-oriented, slow-speed lines such as the Bishop Street Branch, I use manual throws.

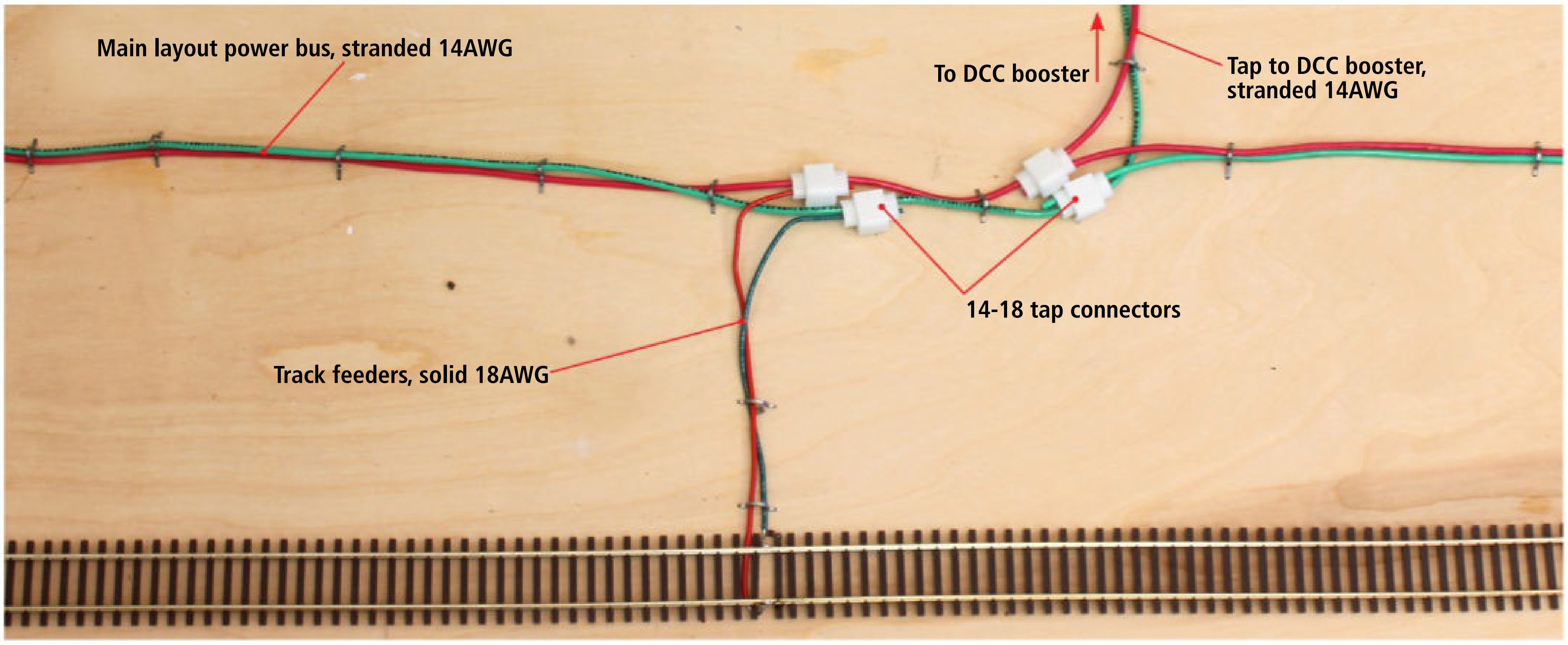
Reliable wiring

Wiring is an area that fills many modelers with anxiety, but it's one of the simpler aspects of layout construction and one where adjustments are easy to make. The biggest mistake you can make (and the hardest to fix) is using too small of wire. My standards are stranded 14AWG for the main bus and solid 18AWG for the feeders ⑩ (opposite).

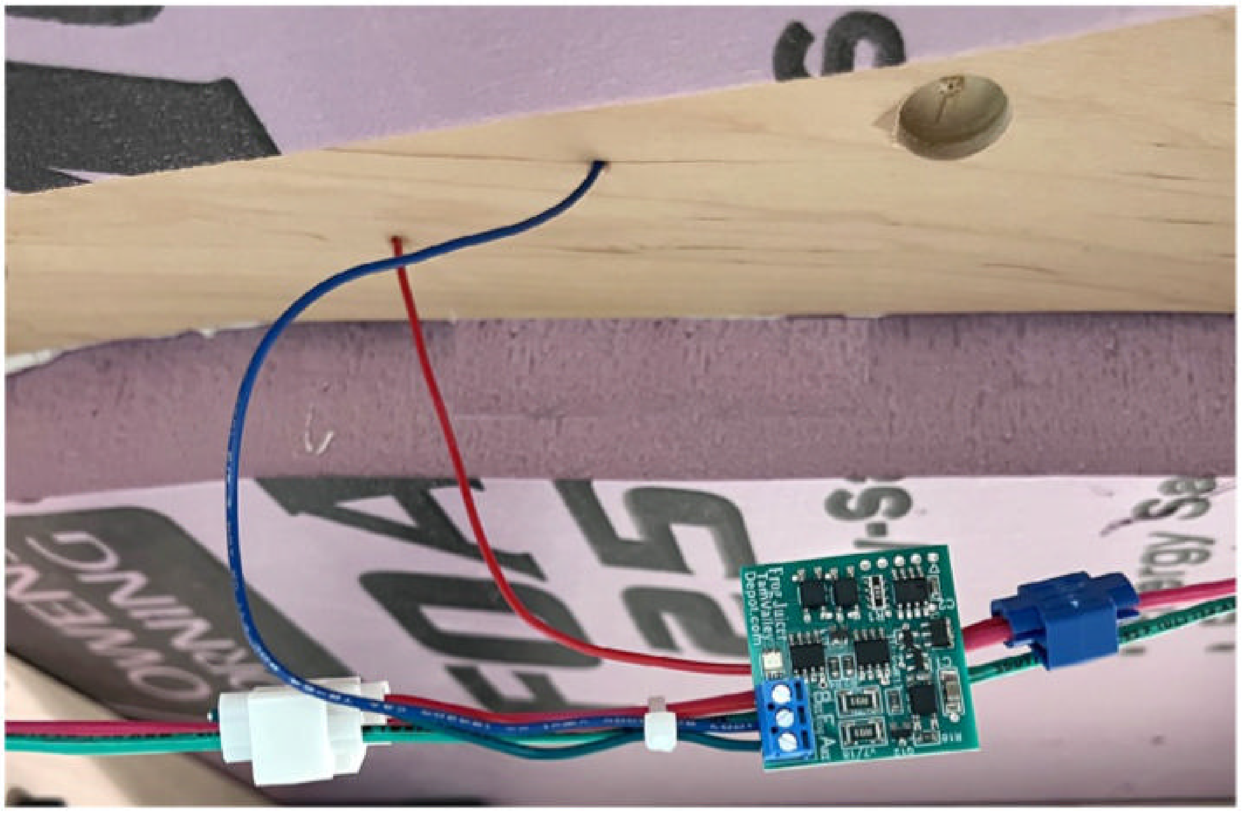
To prevent short circuits, don't get the polarity of your feeders reversed and connected to the wrong bus. This is an easy mistake to make, even for experienced modelers. When I'm connecting feeders to the bus, it's always with the power on and done one set at a time.

What's next

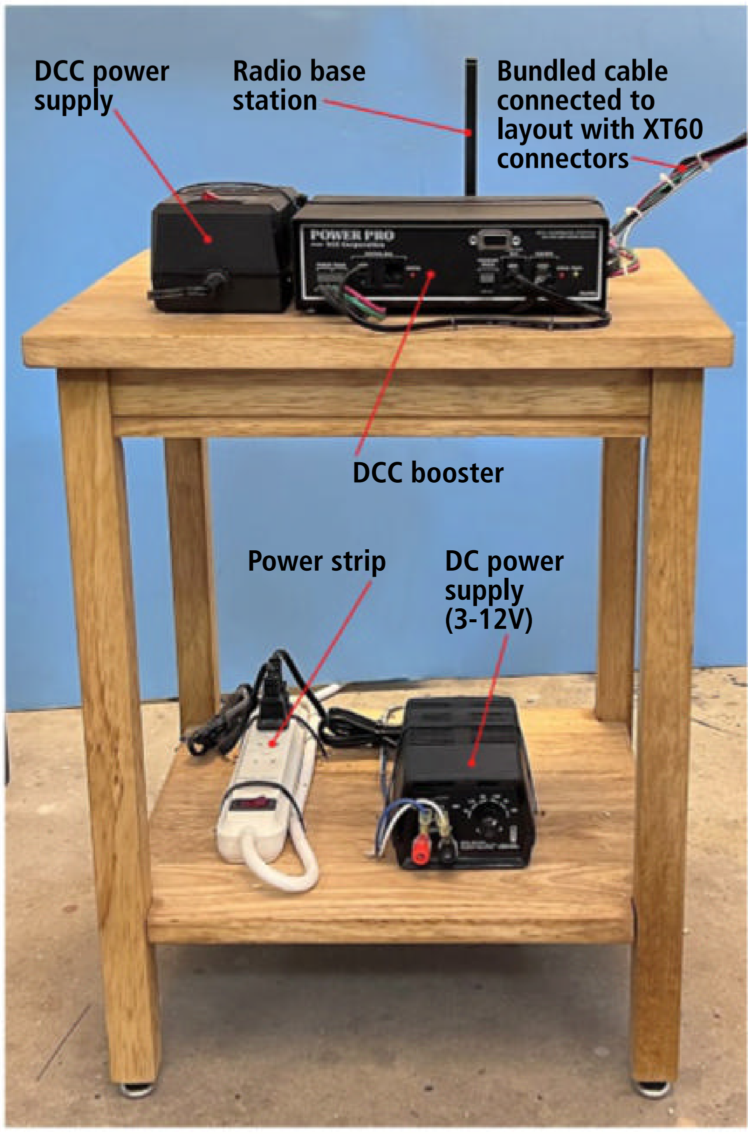
January: Meet the Bishop Street Branch
February: Benchwork, track, and wiring
March: Scenery
April: Structures


Main layout power bus, stranded 14AWG
To DCC booster
Tap to DCC booster, stranded 14AWG
14-18 tap connectors
Track feeders, solid 18AWG

⑩ **Rock-solid wiring.** Lance's recipe for wiring success is stranded 14AWG for the main layout power bus and solid 18AWG for the track feeders. He used 14-18 tap connectors to splice the wires.



⑪ **No more stalling.** To prevent short-wheelbase locomotives from stalling on turnouts, Lance installed Frog Juicers from Tam Valley Depot. The devices sense polarity and power the frog correctly.


DCC power supply
Radio base station
Bundled cable connected to layout with XT60 connectors
DCC booster
Power strip
DC power supply (3-12V)

⑫ **Running trains.** Lance placed the control and power systems for the Bishop Street Branch on this table he found at a store specializing in unfinished furniture. All of the cables have XT60 connectors, making them easy to attach and detach.

That way if there's a short, I know the error is with the feeders I'm presently working on.

I typically drop feeders every six feet or so, but may add more in yard and industrial areas. I pay extra attention to turnouts. Modern turnouts are branded as "DCC friendly." This means the frog is dead, or unpowered. In most cases locomotives will glide over the dead spot without hesitation. However, when you have a group of turnouts placed end to end or are using short-wheelbase locomotives, stalling on turnouts becomes more common.

To get around this, I wire in an electrical device called a Frog Juicer, which senses polarity and correctly powers the frog ⑪. These are sold by Tam Valley Depot (tamvalleydepot.com/products/dccfrogjuicers.html).

Control systems

I use Digital Command Control (DCC) on all of the layouts I build. There are many good systems on the market. Spending months agonizing over which one to pick isn't the best use of your time. Focus on the system you and your operating friends are most comfortable and just go with it.

The nature of my profession is such that I need to standardize and stick with one DCC system. I use NCE's PH-PRO-R ⑫. I always go the wireless route, as it's easier to build and easier for the customer to operate.

Once the DCC system was hooked up, I ran trains and confirmed everything worked. Next month we'll tackle scenery on the Bishop Street Branch. MR

EASY OPERATION, BIG SCENERY

This modeler's third layout is one both he and his grandsons can enjoy

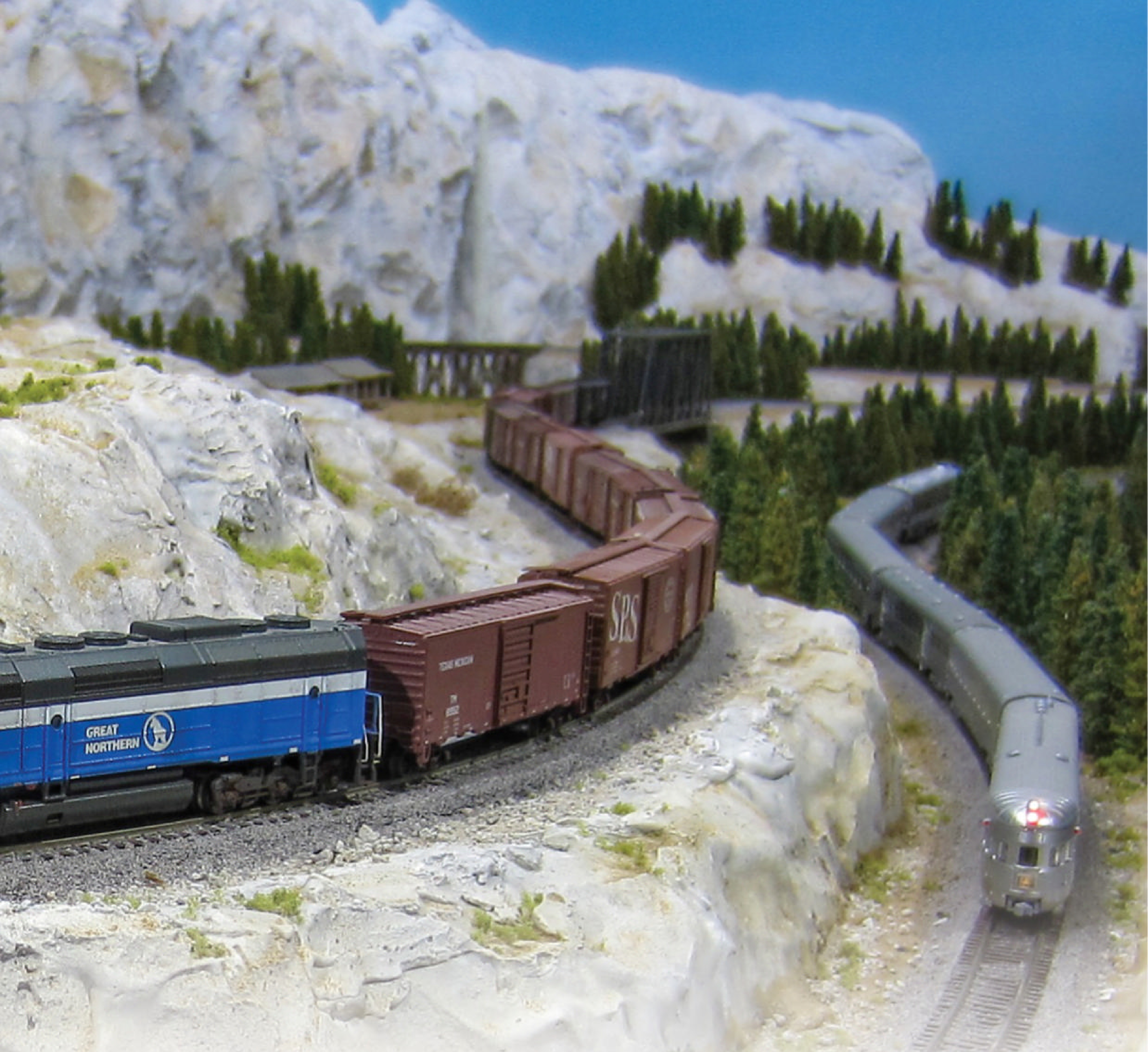
By Mike Bodzewski • Photos by the author

The moment I became a model railroader is still etched in my mind. I was 10, and a friend of my dad who was an avid model railroader invited us over to see his layout. Since I was young, the layout was probably smaller than I remember, but it left a lasting impression. As a parting gesture he gave me a caboose, saying, "This is where all rookies start."

Shortly after that visit, we built an HO layout on a 4 x 8 sheet of plywood painted green. Marriage and a child paused the hobby until we bought a new house with an adequate basement. Since then, I've built and disassembled two N scale layouts.

Six years ago, when deciding on what I would build for my third layout, back issues of *Great Model Railroads* and *Model Railroader* were a big help. The scenery portion of the hobby is my favorite, and easy operation for when my grandsons come over was a big factor. That led me to design a layout with two continuous loops and plenty of behind-the-scenes staging. The layout also had to be one on which my Great Northern equipment would feel at home, so the route starts in the mountains and leads to the ocean. Freelancing let me create the railroad I envisioned. Setting in the mid-1960s gave me the opportunity to re-create childhood memories.

For me a huge part of the excitement of building a layout is learning new skills. So a big part of the planning included using lots of new products and techniques that I had been reading about. Examples include 1"-thick extruded-foam insulation board instead of Homasote, Digital Command Control (DCC) instead of direct current, Woodland Scenics Shaper Sheet instead of cardboard strips, foam roadbed,



① Great Northern Electro-Motive Division (EMD) F45 No. 439 waves goodbye to the *Silver Streak Zephyr* with a Chicago, Burlington & Quincy EMD E5A in the lead. The action takes place on Mike Bodzewski's N scale Great Northern, his third layout.

Scenic Express SuperTrees, static grass, and Woodland Scenics Realistic Water. I also planned to light °my structures for nighttime operation.

Building the layout

After sizing up the basement, I settled on a 10 x 16-foot space with adequate space to move around. A U-shaped layout made the most sense, but one side would have to be about 5 feet shorter than the other to accommodate a post.

The "U" shape allowed for a long staging area on the back of the exposed side. When making scale drawings the curves came first, knowing that the design would incorporate continuous loops. A minimum 15" radii would be used, so those were drawn in first. Then it was just a matter of connecting them in an interesting fashion.

Another puzzler was how to get some grade separation between the two tracks on the mountainside. Since both tracks were coming out from behind the backdrop, a steep enough grade would be prohibitive. The staging area was the solution. Because the layout is two continuous loops, the tracks in the staging area are independent of each other. Raising one set of staging tracks 1½" higher than the other provided significant grade separation as soon as the trains emerge. An added benefit is that since the back staging tracks are higher, access to cars and engines is easier.

The benchwork was built in 4-foot sections so that if ever the need arose, it could be disassembled and moved. Now that it's finished, that doesn't seem very likely. I'd do it again, though, because of the ease of construction. The benchwork is built as a modified L-girder using 1 x 3 for the frame and 2 x 2 legs. At first the

② Burlington Northern Alco RS3 No. 4068 spots two stockcars.

③ Southern Pacific GS-4 No. 4449 heads out of town pulling the *Coast Daylight*.

legs appeared to be sturdy enough by themselves, but I added cross braces for extra strength.

The top is ⅜" plywood with 1" foam board glued on top. The foam was a joy to work with. All cuts were made with a utility knife. Where higher terrain was desired, additional pieces were layered on and easily sculpted with a serrated kitchen knife. An additional benefit is that the foam is lightweight.

The backdrop and fascia were the next to be constructed using ¼" hardboard. To create smooth, rounded corners, some 1 x 2 supports were attached to the back of the benchwork. The hardboard was cut to the correct dimensions and scribed vertically on the back with a utility knife to make it more flexible.

Now the fun started. Even with the lines cut in the back, the hardboard was unwieldy to bend. If only I had another pair of hands. “Honey, can you come downstairs for a minute?” With my wife holding the hardboard in place, I was able to put some screws in, and it held.

All my previous layouts had used code 80 track, but I saw a layout with code 55 at a model train show, and nothing looked as good to me after that. The detail and more appropriate scale changed the whole look of the layout. Some have cautioned that code 55 causes more derailments, but that hasn’t been my experience.

My main line is Micro Engineering code 55 flextrack, while the staging is Peco code 80. The track is glued to foam roadbed, which is supposed to deaden the sound. It was easier to lay than cork, and the end result looks identical. Adding Arizona Rock & Mineral Northern Pacific Light Gray ballast finished the trackwork.

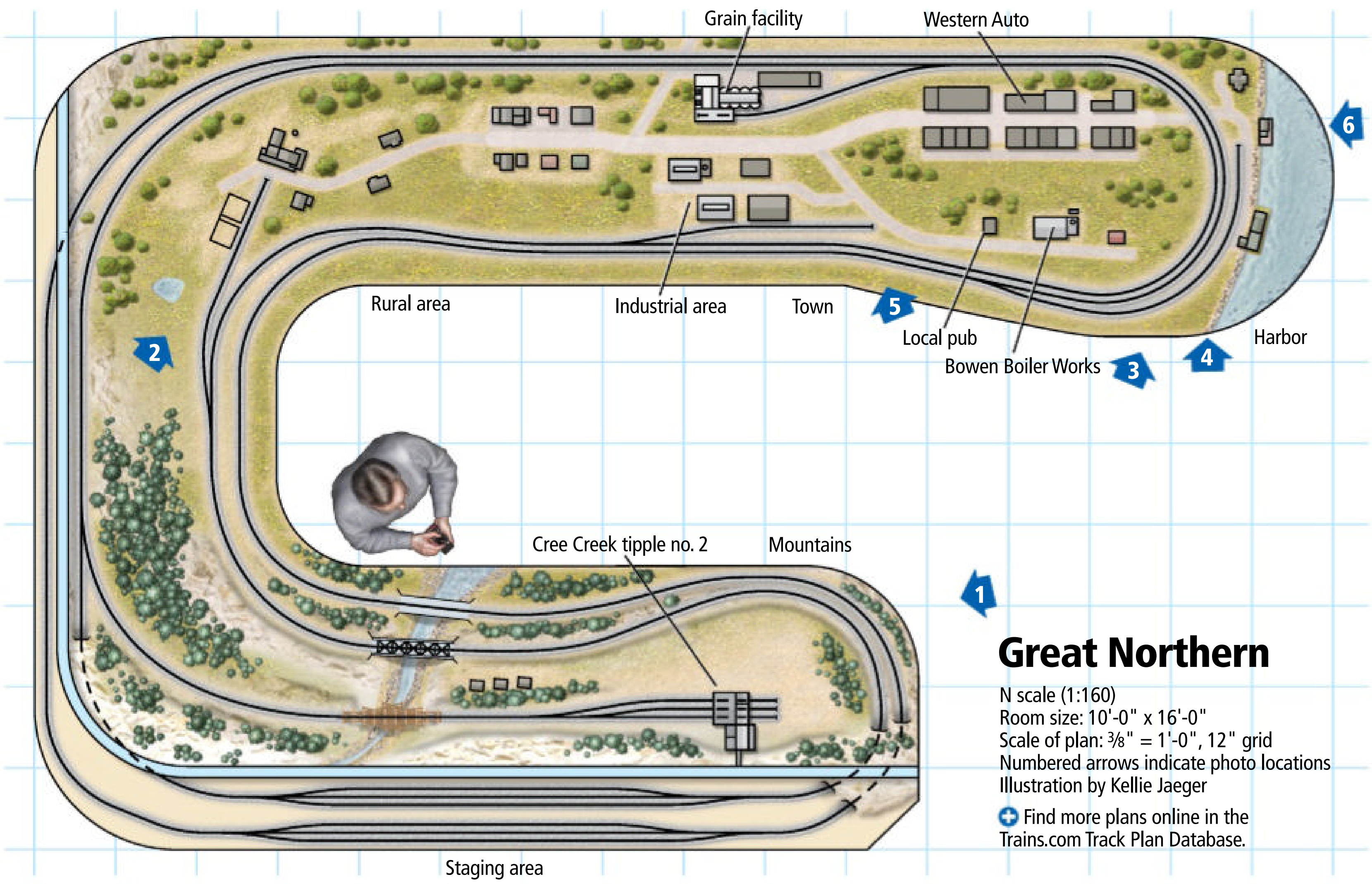
Getting under the layout is one of my least favorite parts of layout building, so new ideas are always worth a try. An article caught my eye that showed how to install Tortoise by Circuitron switch machines on a piece of ¼" plywood and then cut an appropriate size hole in the foam board. This allowed most of the work to be done at the workbench, not under the layout.

Mounting the switch machines before laying the track enables you to place the hole in the switch rod over the actuation wire so you don’t have to search for it from under the layout. Then the track was laid between the turnouts. Of course, you still have to get under the layout to wire the switch machines.

In the staging area, originally the turnouts on each side were independently operated, which caused several wrecks when I forgot to line the far turnout. Wiring them together allows a single throw of a switch to trigger both turnouts. Now if one side is correct, both sides were correct.

To avoid any power problems with DCC, the bus wire is 14AWG stranded and the feeder wires are 22AWG stranded. Feeder wires were connected to each 3-foot section of flextrack. Turnouts and accessories are powered by 20AWG stranded bus wire and 22AWG stranded feeder wire.

Operation with two continuous loops allows for plenty of action when guests come over (especially grandchildren who have limited patience). With three staging tracks for each loop, I can keep



Great Northern

N scale (1:160)
Room size: 10'-0" x 16'-0"
Scale of plan: 3⁄8" = 1'-0", 12" grid
Numbered arrows indicate photo locations
Illustration by Kellie Jaeger

Find more plans online in the Trains.com Track Plan Database.

moving new trains over the layout with plenty of action. The layout has two DCC cabs, including one that's wireless, which lets me stay in the background while sending trains out. For additional operating interest, there are several sidings.

Let's get to the scenery

The trains were run until it was determined that everything worked as was expected. Next it was time for some scenery. Mountains were a must, especially tall mountains that the trains would enter and exit to the back staging area. But they were going to have to be narrow (about 2" deep), as there wasn't a lot of room.

Extruded-foam insulation board was cut into the basic shape for the whole range. But sculpting the foam wasn't producing the contours and pleasing shapes I envisioned because the mountains only stuck out a few inches. Shaper Sheet provided the solution. It's a stiff but bendable metal foil with a felt side that faces out. I cut pieces to fit over the foam board and then crumpled them to get rough, rocky shapes. Happy with the results, I shaped the pieces and glued them to the foam board. A coating of plaster, and they were ready for coloring.

The next trip for supplies wasn't to the local hobby shop but to the local ball field. Several articles have suggested using sifted dust from a baseball diamond as the first layer of scenery. Because it's a medium tan color, it may not be appropriate for everyone's layout, but it works for me. Anyway, because it's the base coat, much of it gets covered up. And the price is right.

Previous layouts provided many buildings and structures I could place on the layout to get an idea of how they would look. One day I set them up one way and then changed it around the next. After a couple weeks of playing musical buildings, the final version finally appeared.

In the main town the structures are styrene kits, while in the rural areas they're Fine Scale Miniatures kits. Building the structures can be a very enjoyable experience, and when you hold them in your hand you can appreciate all kinds of added details.

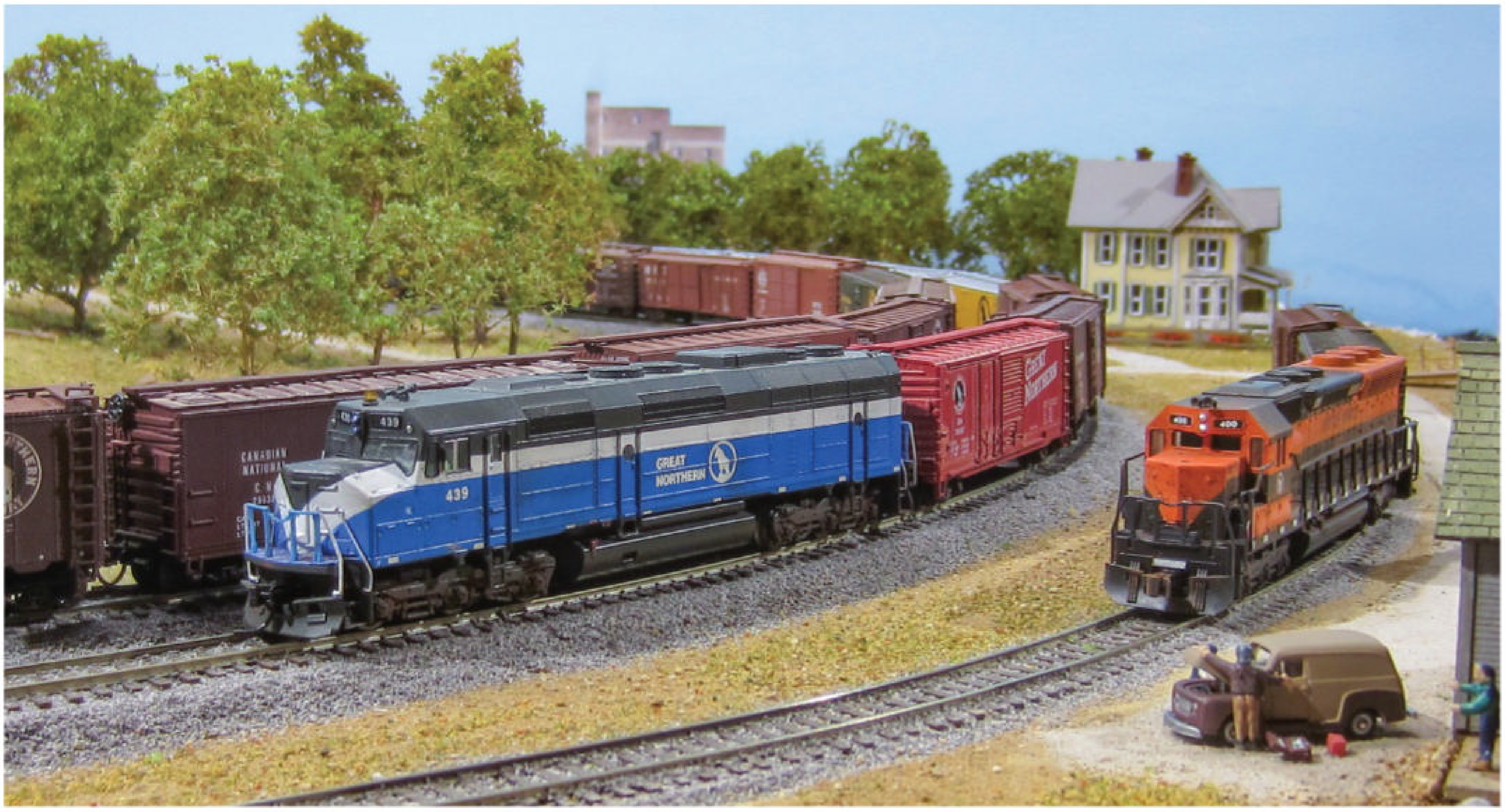
But wait, this is N scale! Once these structures are on the layout, especially the ones in the background, that detail is really hard to see. So if you enjoy superdetailing in N scale, great, but if you don't you can save yourself some time because others aren't going to notice once the structures are on the layout.

Next came the trees. You have to love trees, because they can take a boring part of your layout and turn it into an interesting adventure. The mountain side of my layout needed lots of evergreen trees (hundreds, as it turned out). There are commercial pines that look good, especially if doctored up with some fine ground turf, and some of those have a place on my layout. But there was too much sameness when looking at a forest. My solution was to buy some small (6 to 10 inches) Christmas trees, cut off the branches, shape them to look like a tree, and put some ground cover on them. Interspersed with the commercial trees, the forest looks much more realistic.

The other side of the layout needed deciduous trees. Course turf glued to

The layout at a glance

Name: Great Northern
Scale: N (1:160)
Size: 10 x 16 feet
Prototype: freelanced
Locale: Pacific Northwest
Era: mid-1960s
Style: walk-in
Mainline run: 86 feet
Minimum radius: 15"
Minimum turnout: No. 6
Benchwork: modified L-girder
Height: 46"
Roadbed: commercial foam roadbed
Track: Micro Engineering code 55 (main), Peco code 80 (staging)
Scenery: extruded-foam insulation board and Woodland Scenics Shaper Sheet
Backdrop: painted tempered hardboard
Control: NCE Digital Command Control



④ Great Northern EMD F45 No. 439 heads east while Great Northern SD45 No. 400, nicknamed "Hustle Muscle," picks up cars by the harbor.

⑤ Burlington Northern Alco RS3 No. 4068 picks up a load of hoppers at the grain storage facility.

Upgrading the lights

When preparing this article, one of the most difficult parts was the photography. The lights I had gave the layout a warm hue. My solution was relamping the fluorescent fixtures with daylight light-emitting diode (LED) bulbs (5,500 color temperature). I also added tripods with 1,200 Lumens LEDs on top. Both the intensity and hue made quite a difference. – *Mike Bodzewski*

plastic armatures works but wasn't completely satisfying. They were relegated to the backdrop and Scenic Express SuperTrees were added. They need a lot of chopping if you're making a 40-foot tree in N scale, but the end result is great.

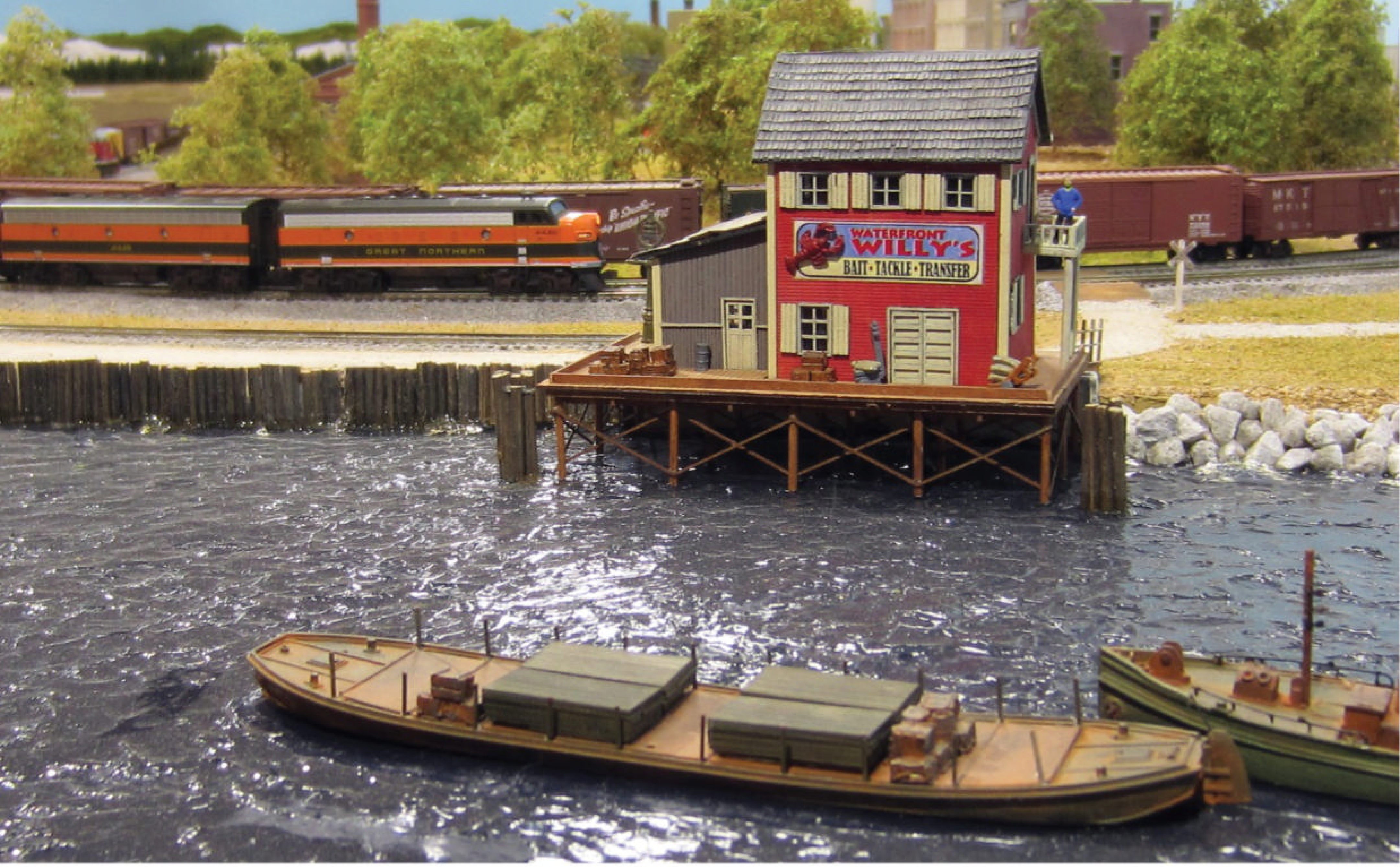
Originally, I sprinkled only fine ground turf on the trees, thinking the leaves that were included would be too big for N scale. Sprinkling a few trees with the SuperTree leaves as an experiment showed how wrong that was. It made them really pop, resulting in all the trees that had originally been planted being uprooted and given the leaf treatment. It was worth it.

Before planting the trees by the backdrop, the backdrop needed to be painted to simulate forests into the distance. Not being an artist, I knew this was going to be a daunting task. YouTube had a video that fit perfectly with my needs.

The artist was painting by stippling the brush on the backdrop. Darker color up front, lighter colors toward the back. He was using only two colors of acrylic paint and blending them as he went along. Who knew that Mars Black and Cadmium Yellow blend to make realistic shades of green? Problem solved.

At this point all the ground cover supplies came out – different colors of fine ground cover, course ground cover, gravel, stones, and more. For me the secret seems to be having a wide array of textures and colors. If all you use is medium green ground cover, your whole layout will look the same, and that's not how nature works. The more adventurous you get, the better things look.

At first, I didn't add any green to the mountain side scenery, thinking it should look barren. On a fishing trip to Canada, however, I saw plants, even trees, growing out of stone landscapes. Now the mountain side has some green.



⑥ Great Northern EMD F7A-B set rounds the harbor while a tug boat pushes a barge along the coast.

A new adventure was adding static grass. After seeing it used at a train show, I had to try it. I used several coats to fill in thin spots in my turf and to heighten the grass in others. Sparingly adding some small stones and bushes gives the area some additional interest.

Still to contend with were two bodies of water. One was a stream on the mountain side and the other was a harbor at the end of the town. Both got a coat of deep blue paint. The river was lined with rocks and filled with Woodland Scenics Realistic Water. The harbor was also covered with Realistic Water, but it looked too smooth. Water Ripples added the waviness needed.

After about six months, in a few areas the terrain base was shrinking and separating from the water. Not wanting to leave it like that, I gently cut out the troublesome parts. I gently poured a little more Realistic Water in the empty spots. That cured the problem, and the water looks just as it did originally.

It always seems like lighting on a layout is a show stopper, so that was another project to be tackled. Even though there are many new forms of lighting on the market, starting with grain-of-wheat bulbs gave me some flexibility. The grain-of-wheat bulbs are hooked up to an old transformer so I can change the light intensity like a dimmer switch. Commercial streetlights, cars, and signals have since been added.

To mount the bulbs in structures, the best thing I have found are coffee stirrers (the ones that look like miniature straws). Pull the wires through the stirrer and you have an adjustable stand for your bulb. If the hole in the stirrer is a little too big, some tape will hold the bulb in place. Drill a hole that allows you to snugly insert the stirrer in the base, wire, and then adjust up or down for the best view.

Meet Mike Bodzewksi

Mike and his wife of 52 years, Linda reside in Palatine, Ill. They have one adult son and three grandsons. Mike retired from the Ace Hardware Corp. where he was Vice President of Merchandising and Advertising. His other hobbies include golfing, fishing, bonsai, reading, and helping Linda with her garden. Model railroading has provided Mike with endless hours of enjoyment.

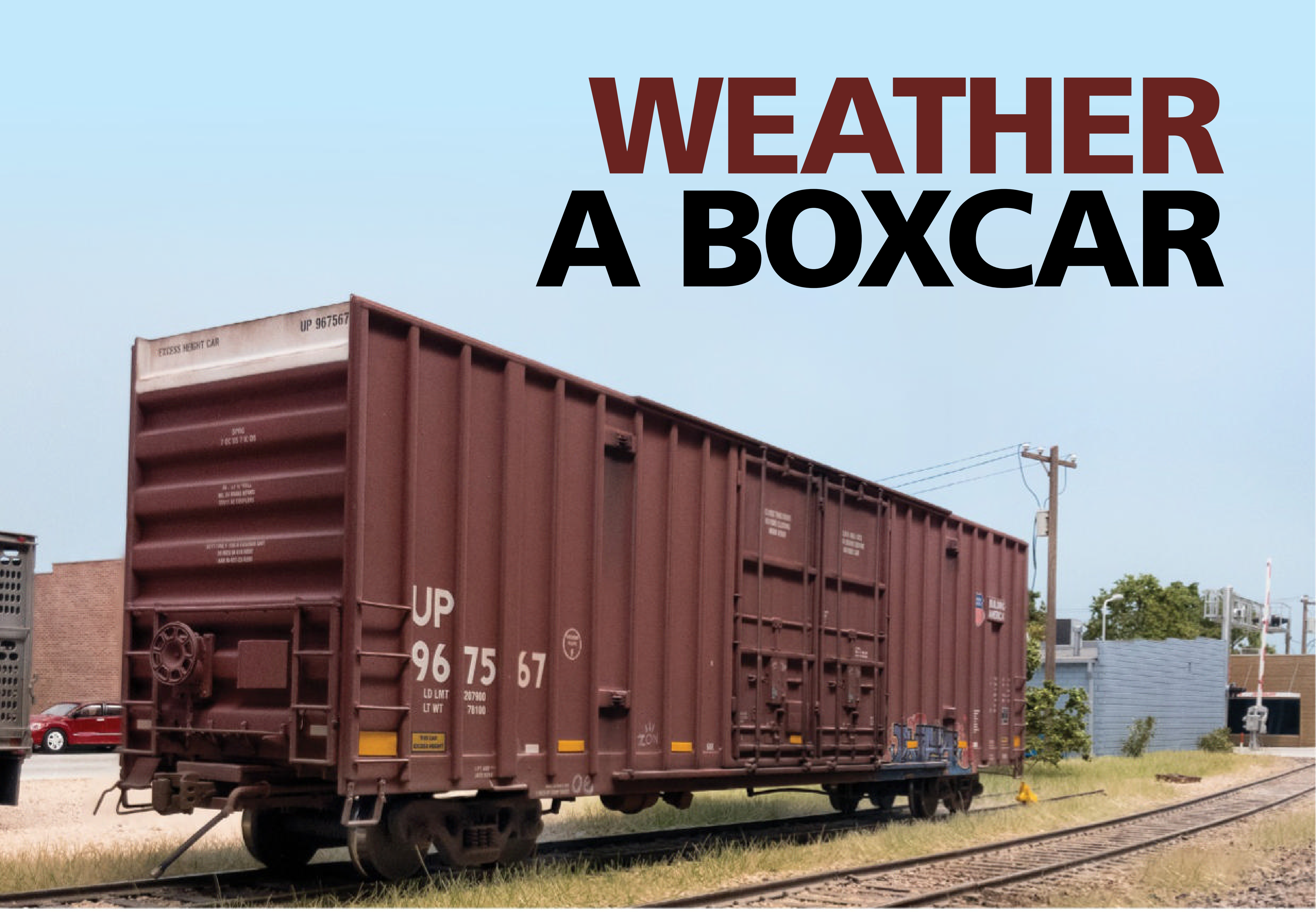
Most of us become a little complacent about our layouts. We start to get blind spots. We see the layout day after day and accept everything just the way it is. Taking a trip around my layout every six months or so and looking at it as if for the first time, I always seems to uncover areas where a little work will make a big difference. That gives me something to do on the layout for the next six months.

Sharing the fun

By no means am I a prototype railroad expert or a modeling expert, but I love to learn. I have a heck of a lot of fun building and running my railroad. At this point my layout is pretty much finished, and that would have been the end of the story.

But then I read the editorial by Steven Otte in *Great Model Railroads 2020*. He encouraged readers to share their layouts with him. Since my layout has only been seen by family and a few friends, I decided to share it here. I hope you enjoyed learning about my model railroading adventures.

WEATHER A BOXCAR



Even a modern boxcar needs some degree of weathering to look realistic.

Give an Athearn 60-foot HO scale boxcar road wear in a few easy steps

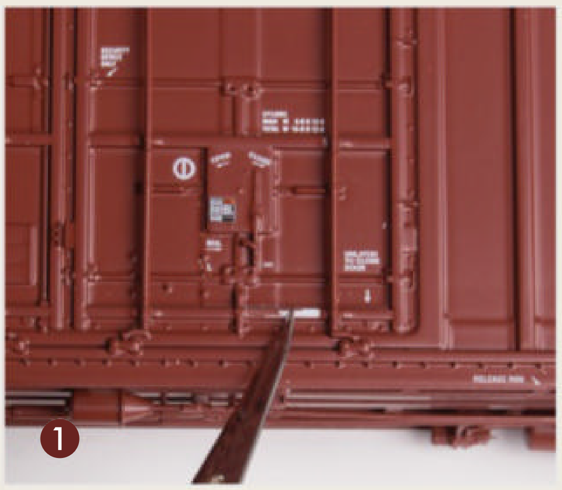
By Pelle K. Søeborg

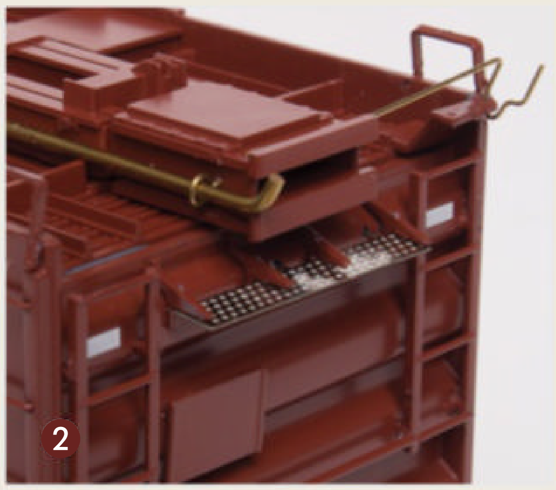
I OWN SEVERAL 60-foot Gunderson boxcars, and cars this new do not require a heavy amount weathering. You can change the character of a car like this in a few easy steps, so if you have never tried to weather a freight car before, this might be a good starter project. A weathering job like this can be done in a day, including drying time.

The techniques and materials I use are the same that I use on most of my freight cars. All you need is an airbrush; a couple of soft paintbrushes; some white, gray, and brown paint; and a few shades of powdered chalks.

Before beginning the weathering process, you should first clean the car. I use a soft cloth and a few drops of blue window cleaner.

STEP 1 PREPPING AND DETAILS

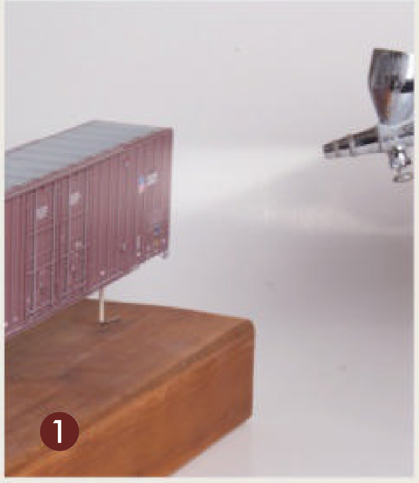


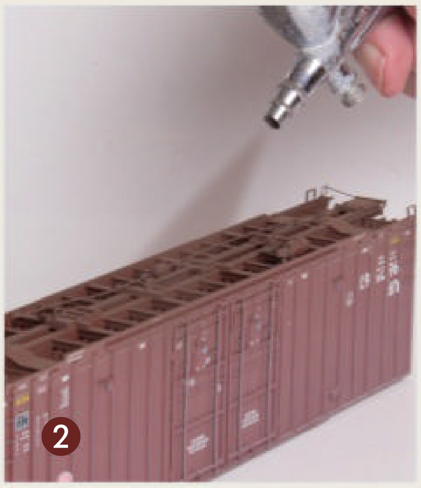


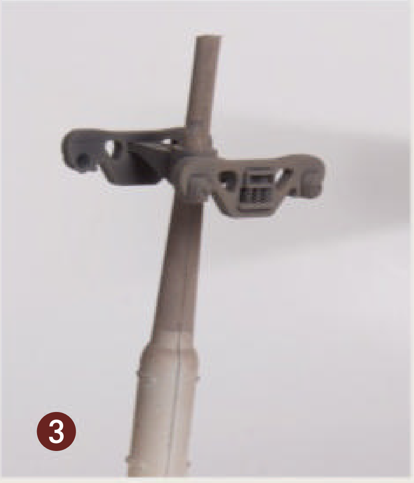
First, I scraped off the horizontal white stripe on the doors ①. You can leave the stripes on, as I'm sure that Athearn had a reason for applying them. The only reason I removed them was that they didn't appear on the more recent prototype photos I had of the car.

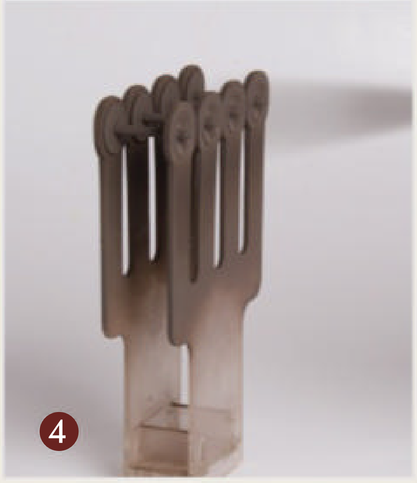
Next, I made an air line at each end of the car from brass wire ②. When the weathering was finished, I mounted North American Railcar Corporation magnetic air hoses to the wire. I apply air hoses to all new pieces of rolling stock. I also made uncoupling levers from thin brass wire. Both the air line and the uncoupling levers were attached to the car with cyanoacrylate adhesive (CA). Before moving on, I wiped the car clean of grease and fingerprints.

STEP 2 CARBODY WEATHERING









I started by fading the original paint on the carbody. I airbrushed the sides and ends with Model Master No. 1768 White thinned to a wash (1 part paint to 3-4 parts thinner) ①. [Model Master paints have been discontinued by the Testor Corp. Similar paints are available from other manufacturers. - *Ed.*]

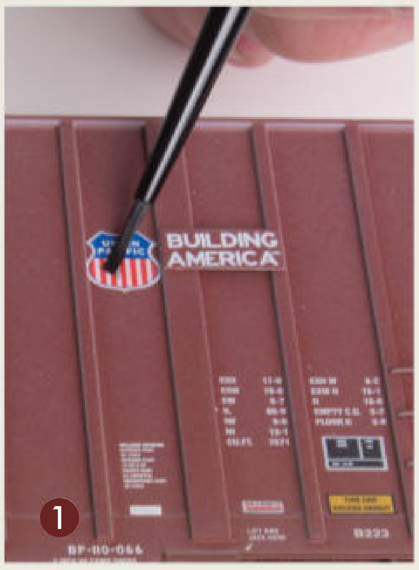
The roof received a couple coats of Model Master No. 1733 Camouflage Gray thinned to a wash. I applied the white and gray wash as several light coats instead of one heavy coat, which makes it easier to control the fading.

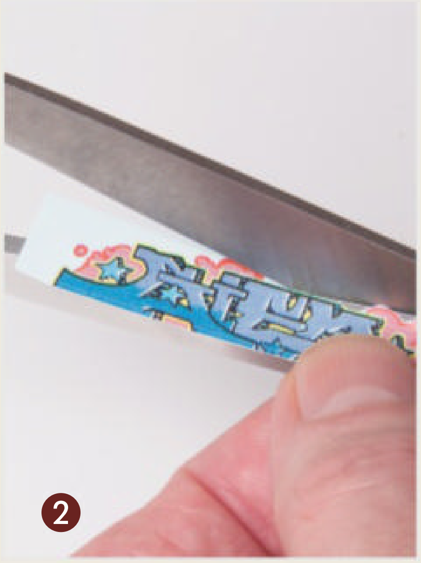
To simulate the mud, dust, and grime stirred up by the wheels while the car is in motion, I gave the underside of the car several coats of Model Master No. 2125 Earth Gray thinned to a wash ②.

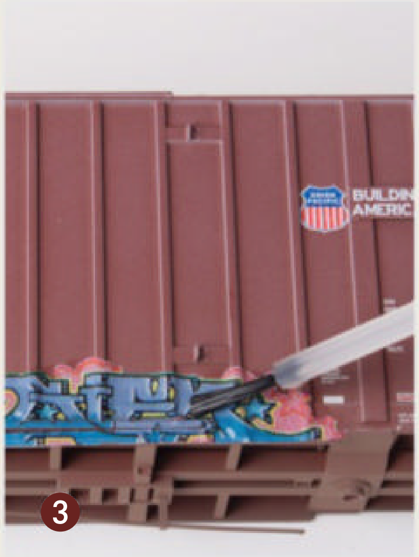
The trucks received the same treatment as the carbody. First, I airbrushed them lightly with Model Master Camouflage Gray and then with Model Master Earth Gray, both thinned to a wash ③. Finally, I gave them a protective coat of Vallejo flat varnish (No. 70.520).

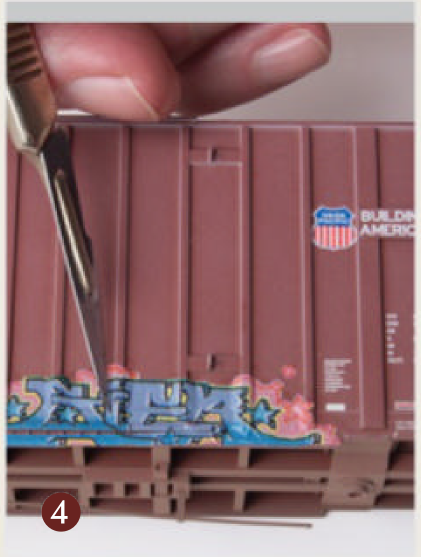
I placed the wheels in a laser-cut jig from American Model Builders. The jig holds and masks the wheel treads at the same time. I covered the pointed axle ends with a dab of liquid masking before I airbrushed them with Model Master Earth Gray ④.

STEP 3 DECALS AND MARKINGS









The UP herald looked a little hazy after the fading, so I cleaned it with a brush dipped in thinner ①. This is only possible since I used enamel colors for the fading. If I had used acrylics, I would have needed to rub the fading off the herald with a toothpick, as thinner will not dissolve acrylic paint when it's dry.

Next, I added graffiti. Like it or not, graffiti is a part of modern railroading. If you don't feel like hand painting your graffiti, Blair Line offers a wide range of graffiti decals. You get the best result by trimming the decal so there is no clear film around the image ②.

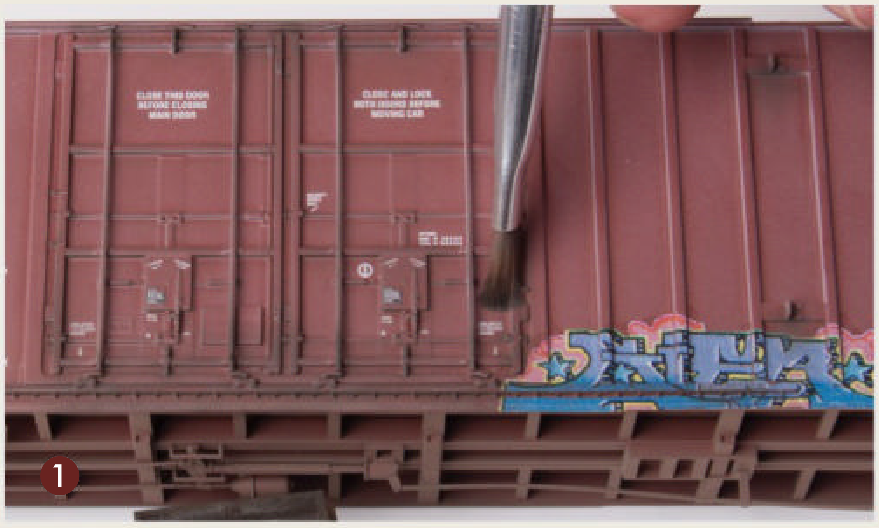
I soaked the area where I wanted the decal with Micro Scale Micro Set and gently pushed the decal in position. Micro Set is a setting solution that softens decals and improve how they adhere to the model. Let the Micro Set evaporate before proceeding.

Then I applied Walthers Solvaset to the decal ③. Solvaset softens the decal enabling it to settle over small objects. However, there is a limit to how much the decal can stretch. If you place your decal over larger objects, you need to cut two slices in it where the channel is located.

While the Solvaset works, it's best not to touch the decal and let the Solvaset do its job. Sometimes the decal may need a little help to fit tightly around objects, like the bracing on this car ④. I cut the decal along the bracing with a sharp scalpel and applied more Solvaset.

Besides the graffiti decal I also hand-painted a few tags on the car.

STEP 4 BRUSH WORK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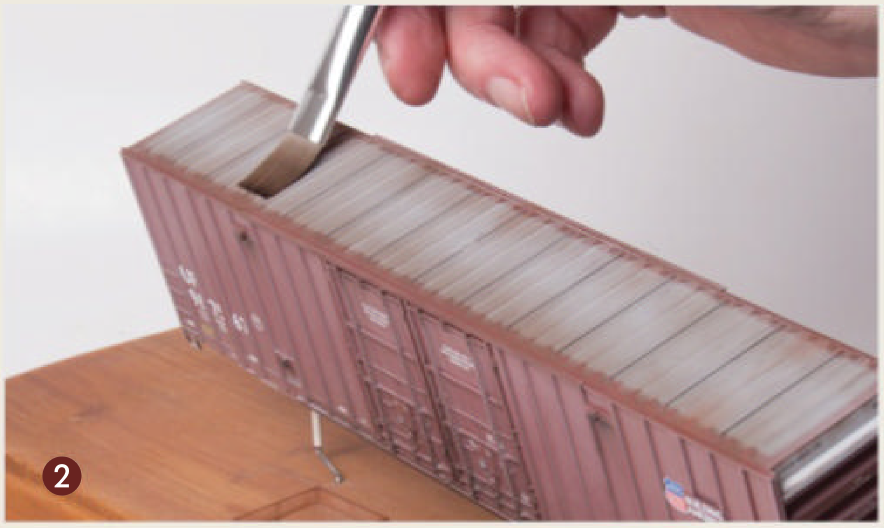
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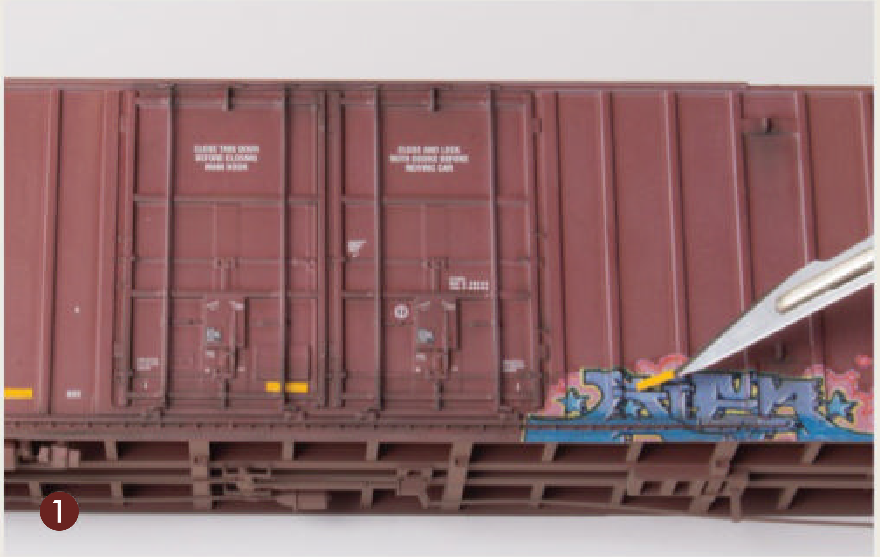
On the prototype pictures I have of this type of car, the edges of the doors, the sliding door channel, and the area below were dark and grimy. I replicated that with black powdered chalk applied with a soft brush ①.

For the roof I used powders in the shades rust, brown, and black. I applied the various shades of powders to the roof with a wide, soft brush. To obtain a realistic look, I brushed from the edge of the car and toward the center of the roof ②.

[Pan Pastel weathering sets and applicators, as well as weathering powders from Monroe Models, are available from KalmbachHobbyStore.com. – *Ed.*]

STEP 5 FINISHING TOUCHES

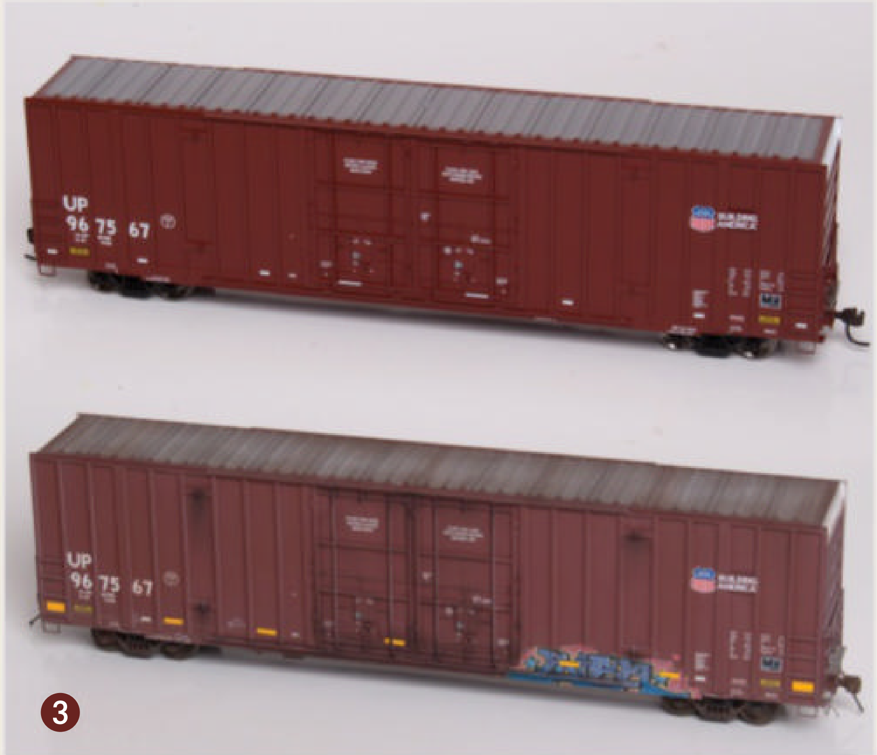

1

2

I model the modern era, so my boxcar needed FRA-mandated reflective striping ①. I used self-adhesive reflective stripes from Smokebox Graphics. Not only are they easy to apply, but they are also reflective like the prototype. The placement of the stripes can vary. I had prototype pictures of three of these cars and the location of the stripes was different on all three cars.

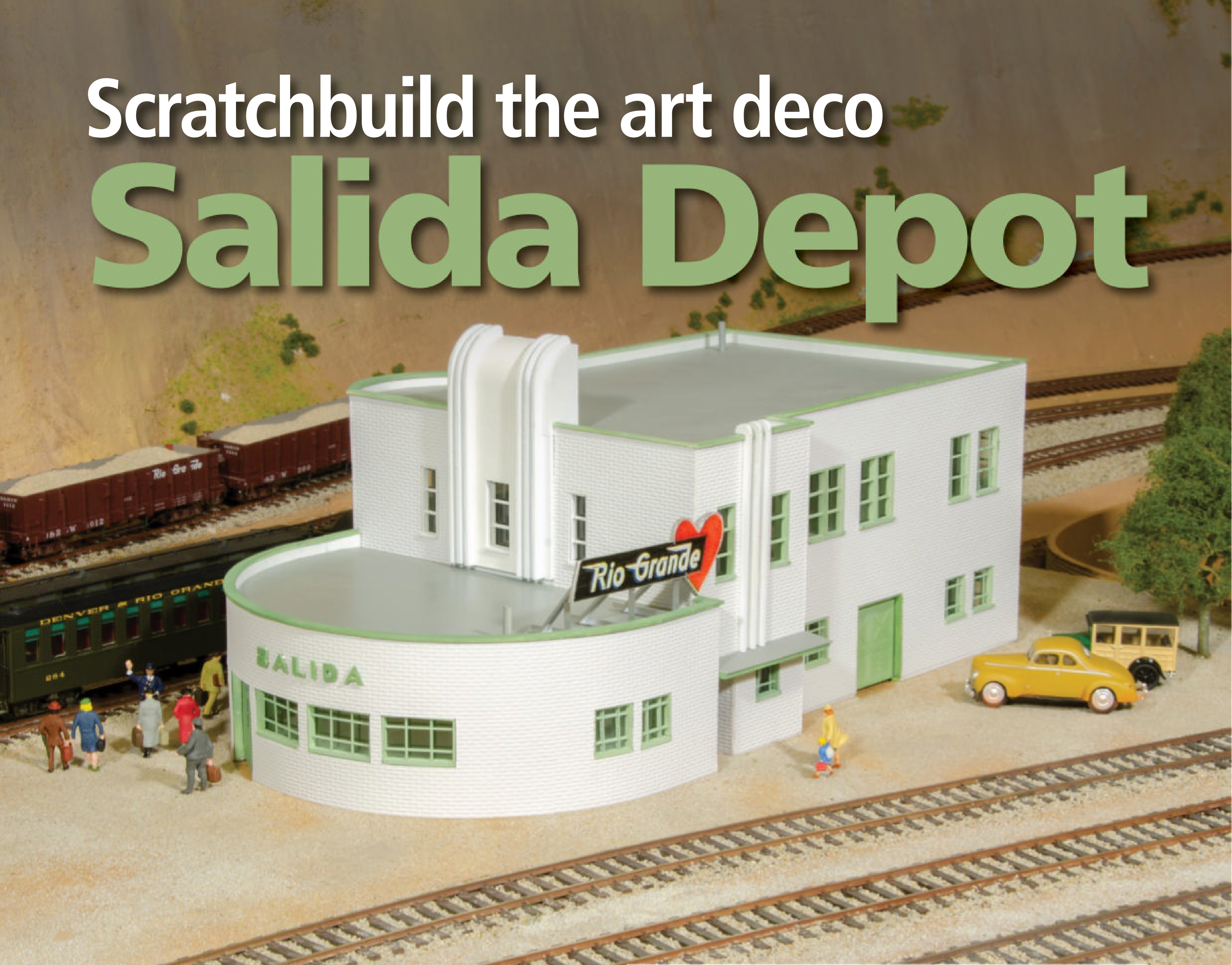
Finally, I sealed the weathering with a protective layer of Vallejo Polyurethane Matt Varnish (No. 27.651) followed by a layer of ordinary Vallejo Matt Varnish ②. The Polyurethane Matt Varnish dries with a slight shine, while the ordinary Matt Varnish dries dead flat. Depending on how much you handle your rolling stock, you can skip the layer of polyurethane varnish and leave it with a coat of the ordinary matt varnish.

Photo ③ shows the boxcar before I did anything to it and after the weathering. Although it only received what I consider to be a relatively light weathering, it changes the appearance of the car completely. MR

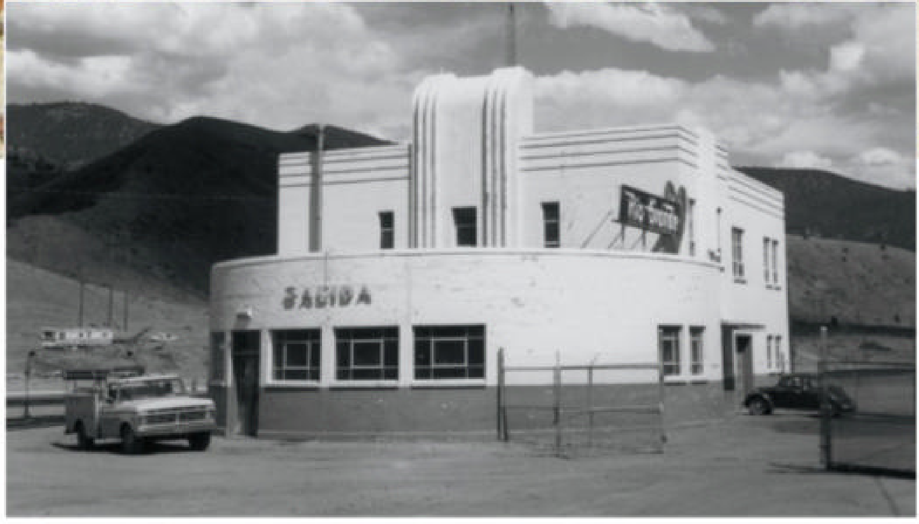


3

Scratchbuild the art deco Salida Depot



① **The model.** At the Salida Depot, the conductor signals passengers to board the daily narrow gauge *Shavano* en route to Montrose via Marshall Pass.



The prototype. This picture shows the prototype Salida Depot in its later years. Friends of the Cumbres & Toltec Scenic Railroad photo

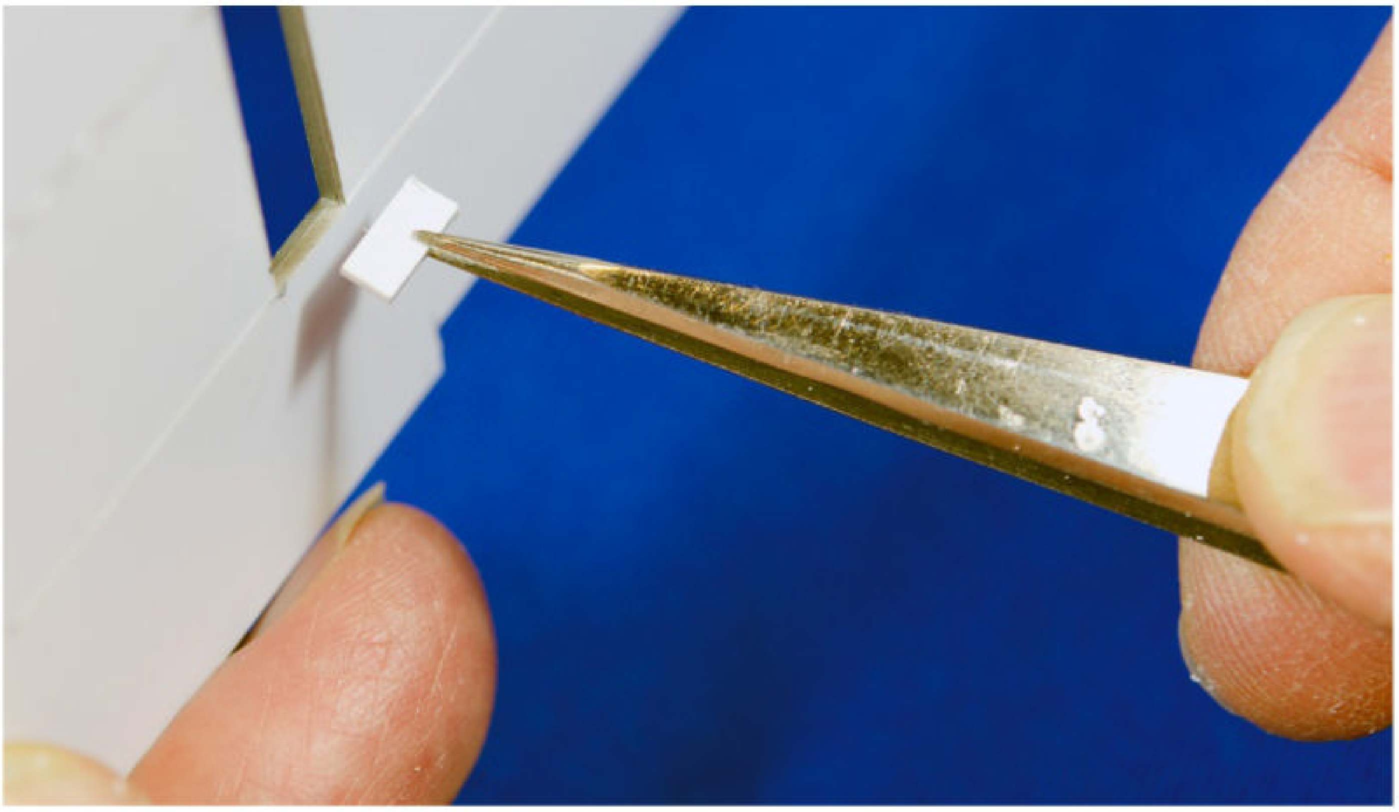
A brick depot inspired by an art deco masterpiece

By Gerry Glancy • Photos by the author

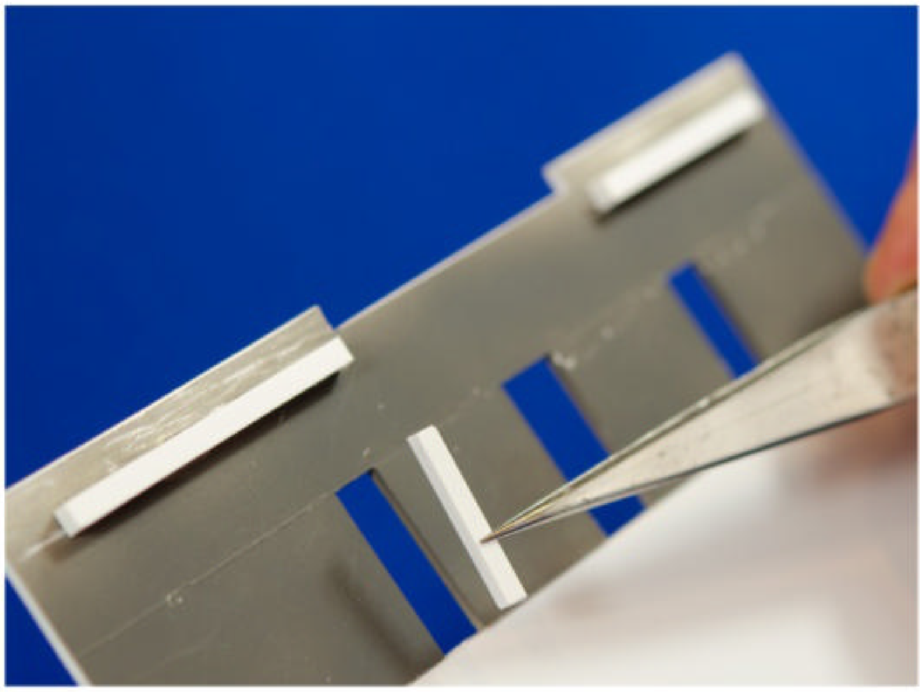
In 1941, at its division point in Salida, Colorado, the Denver and Rio Grande Railroad (D&RGW) replaced its aging wood depot with a new brick art-deco style building. This style is characterized by precise and boldly delineated geometric shapes. It was the only art-deco building constructed on the D&RGW. This was all the more incongruous in that the location was not a teeming metropolis, but a sleepy mountain town almost totally dependent on the railroad for its existence. Regrettably, when the railroad left town in the 1980s, the depot was torn down. It lives on, however, as a model on my Dueling Gauges Railroad and Navigation Company ①.

Preparation

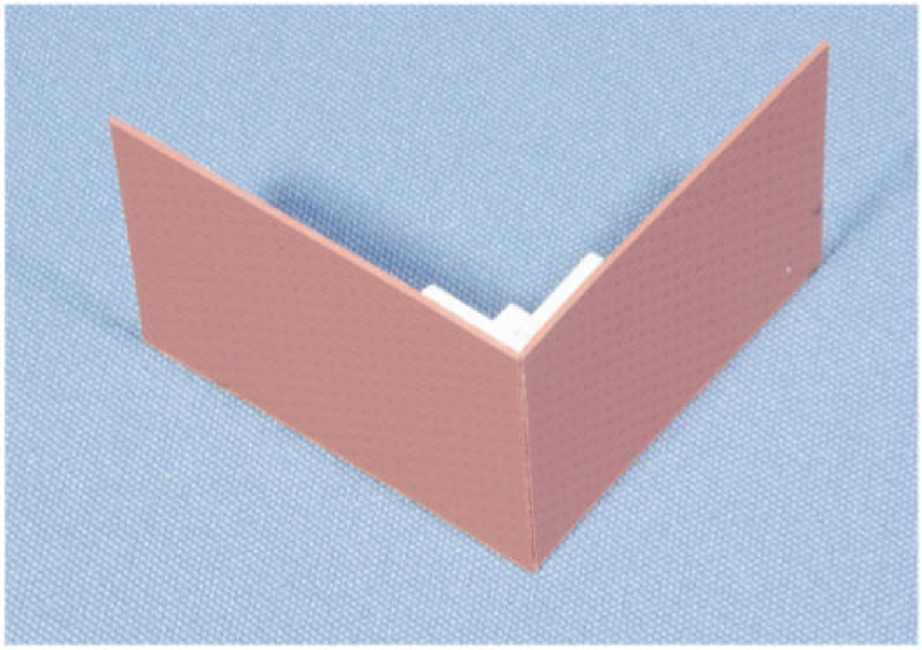
I could never uncover any plans or elevation for the station, though I did discover some rough footprint dimensions. Using numerous historical photographs, I took



② **Window sills.** A piece of. 040" x .125" styrene strip is placed as a window sill.



③ **Window framing.** .100" x .100" angles are placed from behind to frame the windows. The inside of the sub wall is painted black to block light from glowing through. Note the ⅛" x ⅛" strip for roof support.



④ **Mockup.** The brick sheet is glued to the sub wall with ⅛" x ⅛" square corner reinforcement. This was a mockup to ensure that a clean joint can be obtained by beveling the edges of the sheet. It's not a part of the model.

measurements of known size objects in the photos, then drew my own elevation. I soon discovered the size of the building would exceed the available layout space, so I reduced the size of the model by 10%. If you desire to build your model to true HO scale, add 10 percent to all the dimensions in this article.

Per the prototype, the side with two freight doors is the "track side" and the side with one freight door is the "town" side. Online photographs should be consulted to appreciate the general construction, especially the window shapes.

Floor, flat sub walls, and window openings

Construction is almost entirely styrene sheet, strips, and shapes. The floor is cut from .040" styrene sheet (Evergreen 9105). The notches in the floor are to accommodate the doors. I glued ¼" x ¼" styrene strips (Evergreen 199) along the edges of the floor to support the sides, but didn't block the door openings. All of the flat sub walls consist of pieces of .060" styrene sheet (Evergreen 9106). The sub walls are cut in a mosaic fashion to frame the window openings. I also glued ⅛" x ⅛" styrene strips (Evergreen 186) ⅛" below the top, inside edge of the sub walls to support the roof.

The window sills are .040" x .125" styrene strip (Evergreen 146). These are glued so that the back edge will be flush with the window angle frames ②. The window and door openings are framed with .100" x .100" angle (Evergreen 293). I cut them to size and glued them from within so that a single edge protrudes out of the sub wall window opening ③.

Brick sheet outer walls

Plastruct 91611 brick sheet is used as an outer veneer over the entire building. Photo ④ shows a mockup of how the thin brick styrene sheet outer wall is glued to the sub wall. Note how the edges of the brick sheet are beveled so the bricks align. For this reason, any dimension of overall width for the outer walls should be considered nominal. I cut the outer walls a bit long and adjusted them after cutting the window openings. In this way, an exact match with the adjacent wall can be obtained. The outer walls of the track side and town side are wider than their respective sub walls by only the thickness of the brick outer wall sheet. Nonetheless, the same caveat applies; cut a bit long and adjust at time of final fit.

I measured the window openings on the sub walls and cut the window and door openings on the brick sheet to obtain a precise fit. The frames tend to hide any slight imperfections in your cutting, but not your measurements. I checked for fit but did not glue the brick sheet to the sub walls until after painting the window frames ⑤.

Steel sash window muntins and stiles

The window muntins and stiles are steel sash in an unusual arrangement of panes consistent with the art deco concept. In order to replicate the design I used a Grandt Line 5077 steel sash window. I cut the muntins to give a large center pane. I measured precisely and glued them into the appropriate window openings.

The windows with two horizontal muntins are easier. I cut .030" x .030" square styrene strip (Evergreen 131) to size and glued it into the window openings. The double windows have a vertical center sash of .040" x .125" strip (Evergreen 146), with three horizontal muntins on either side ⑥.

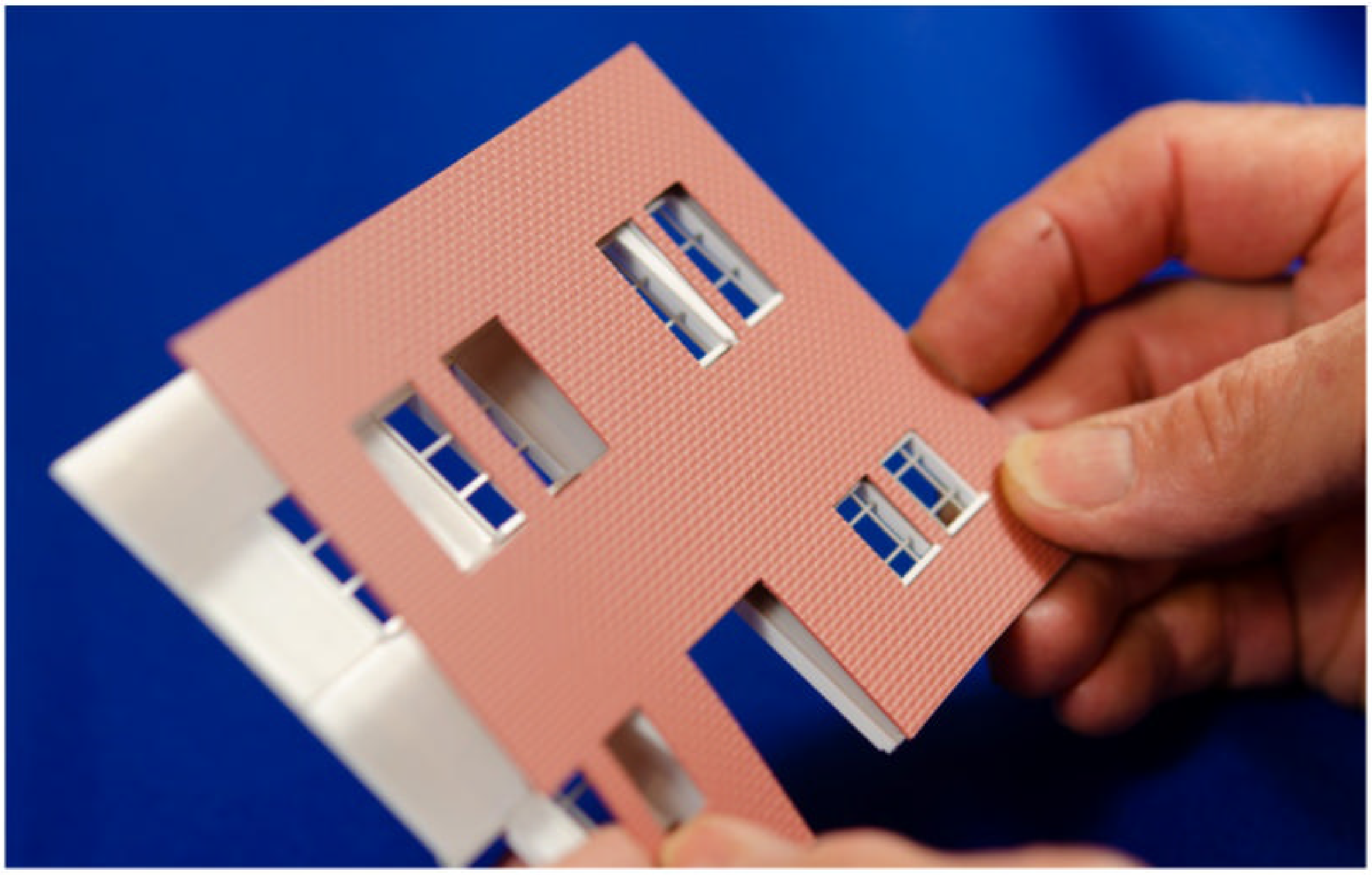
Curved walls

This was the most challenging part of the construction. It was also the reason that the thin brick sheet was chosen, as it permits an even bend around a curved surface. The first step was to find a "mold" of the correct size within which the curved wall of the waiting room could be constructed. My hardware store provided a 6" cleanout drain plug with an inside diameter that fit the width of the waiting room (Lowe's SKU 611942032556).

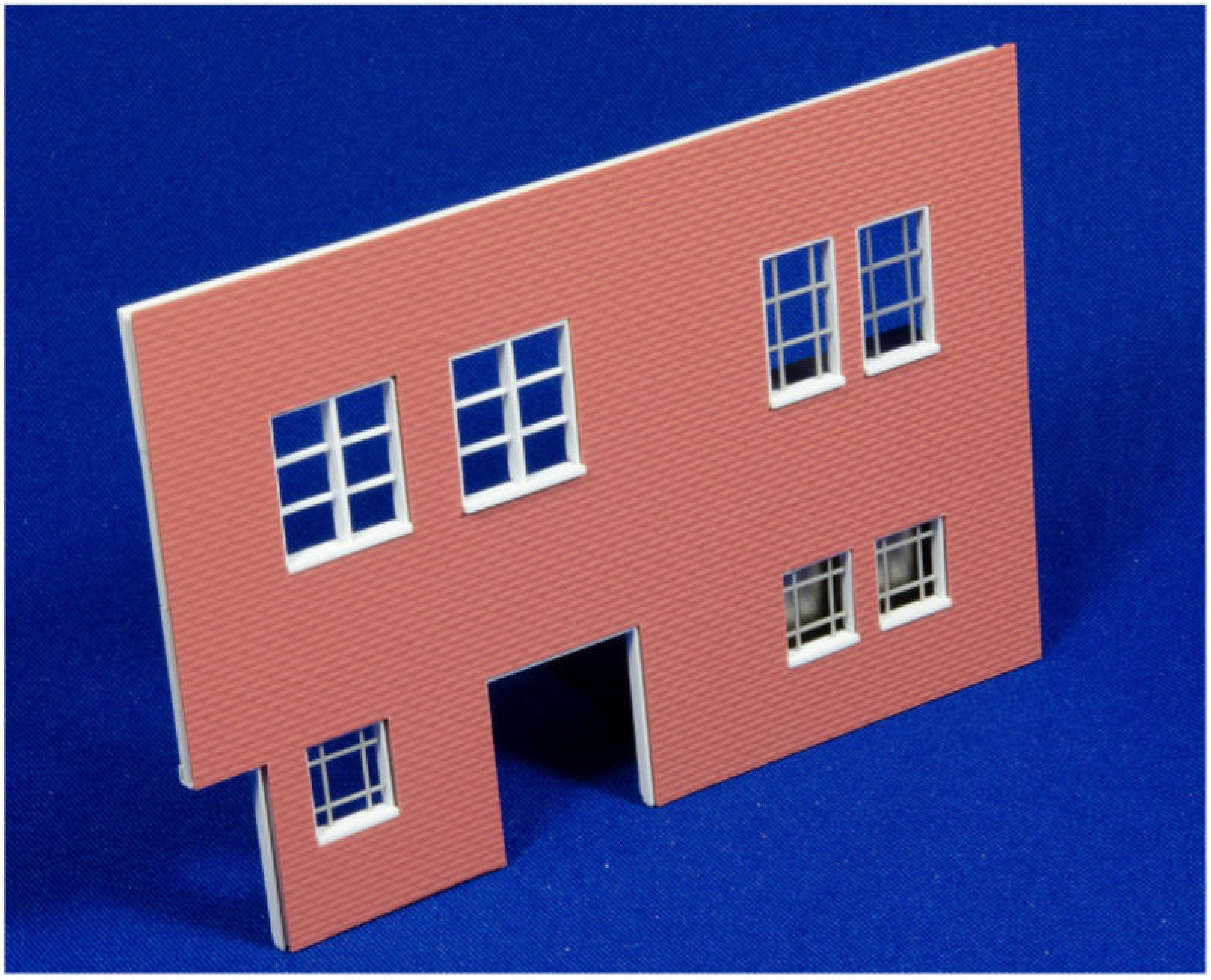
In order to ensure an even bend without kinks, the sub wall is a lamination of three sheets of .020" sheet styrene (Evergreen 9103). The total length of the sub wall is nominal. I cut it longer than necessary and then adjusted to fit the floor pattern. I did not cut the door opening, but cut a long slot encompassing the six rectangular windows and the door in the three pieces of .020" sheet styrene. I also slotted the two square window openings. Then I laminated the three pieces with styrene cement and placed them in the drain plug mold ⑦.

Using .060" x .156" styrene strips (Evergreen 157), I delineated the separate windows. I then cut the door opening. All windows and the door are framed in the same manner as the flat walls. The waiting room wall is glued to the floor and buttressed with a cross wall of .060" styrene sheet ⑧.

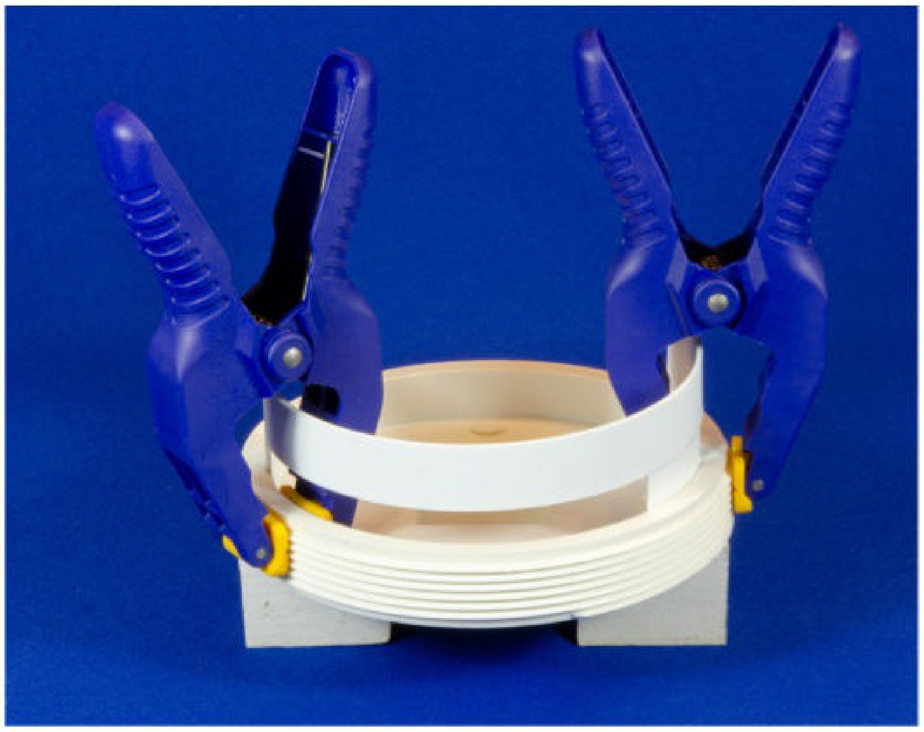
In like manner the small, curved wall on the track side was constructed over a 15 ounce can of Eden Organic Pinto Beans with rubber bands to hold the styrene sheets while laminating. There is nothing special about the can so long as it's 3" in diameter. I cut the window opening first, keeping in mind there is a slight shift in the window position when going from outer laminate to inner laminate. I cut and glued in the window muntins as was done with the flat sub walls. Then I sanded and filed the back edge of the wall to



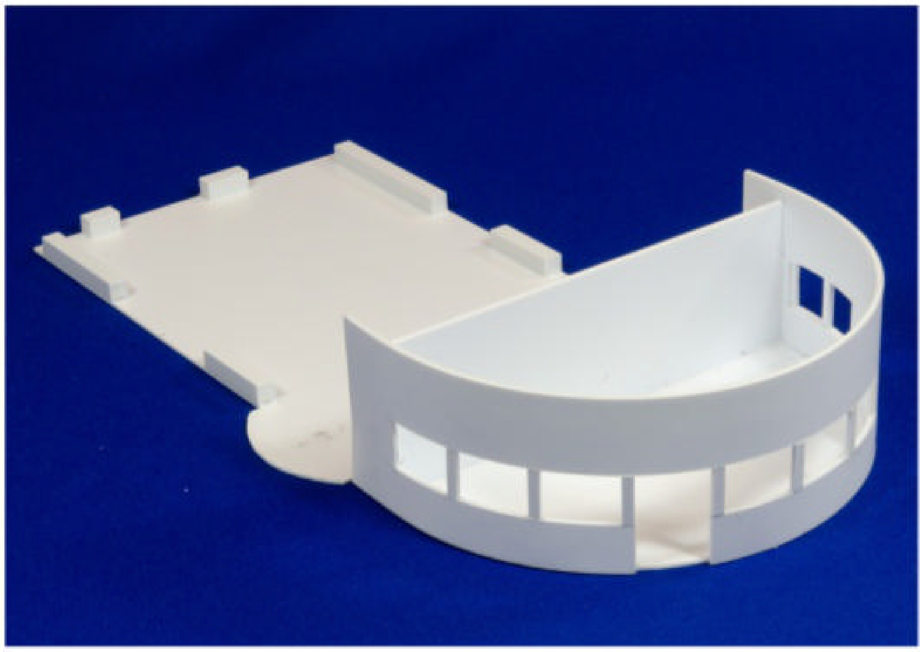
⑤ **Snap on.** When finished, the outer-wall should "snap" onto the sub wall.



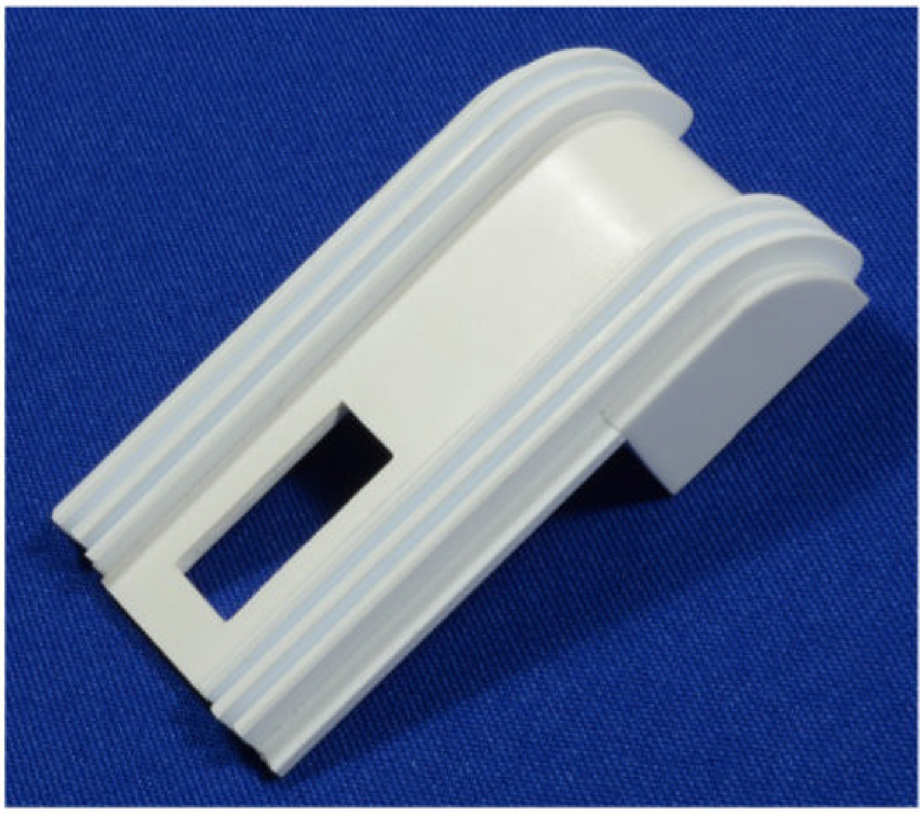
⑥ **Pop off.** Completed town side sub wall and outer wall. Note that upper windows are simple horizontal muntins of .030" x .030" square strip. The outer wall will "pop off" to allow painting of windows.



⑦ **The drain plug.** Turn the plug upside down and clamp three layers of .020" styrene sheet together. Note the slot for windows, which facilitates a smooth bend.



⑧ **Waiting room.** The completed waiting room sub-wall and cross wall. Note that windows have now been created with .060" x 0.156" strips and the door opening has been cut.



⑨ **Art deco windows.** Alternating fins were laminated together to give the completed structure an art deco feel.

provide a flush fit to the trackside sub wall.

The pylon and roof

The decorative tower-like appendage projecting above the second story is the pylon. Note that it is centered on the two-story part of the station, not the curved one-story waiting room. First I built a center box of .040" styrene and applied a window cutout to it (.060" styrene sheet). I covered this construct with .005" styrene sheet (Evergreen 9009). I used glue sparingly to avoid distorting, or melting, the thin styrene. Then I cut side elements from .060" styrene sheet. The larger fin is cut from a single piece of .060" styrene sheet. The smaller fins are .060" sheet and a "leg" of .060" x .060" styrene (Evergreen 153). I built a sandwich of fins, alternating between large and small, ending with an outside element of .125" styrene sheet (Evergreen 9108) and a "leg" of .060" x .125" strip (Evergreen 156) to complete the pylon ⑨. The two roof pieces were cut from .040" styrene (Evergreen 9105). The roof can have a grey textured tar paper applied or just simply paint a medium grey (Tamiya Medium Sea Gray AS-32). Since the building obtained its heat from the yard steam plant, I put a simple vent on each roof section, serving as a handle to lift off the roof. (In later years prototype pictures show two ugly stovepipes added.) On the inside of the waiting room wall I glued short pieces of .125" x .125" styrene strip ⅛" below the top edge to support the roof.

Painting and erecting flat walls

I elected to paint the station as it was at the time of its construction. I painted it all Model Master flat white FS37875, with cap rail, doors and window frames painted Model Master pale green 4739. [Testors has discontinued Model Master Paints. – *Ed.*] Later in the life of the prototype the windows were white and a distracting greenish-gray band circled the lower half of the station.

I painted the windows then proceeded to glue the flat walls together and to the floor. I used squares and clamps to ensure plumb alignment ⑩. The front flat wall was then constructed. The two lateral windows are framed with styrene angle strips, but the center window is left as is. The pylon is glued to the front wall and the brick outer wall applied. As noted previously, the pylon is centered on the back wall, not the front wall (art deco, again). The windows of the front wall are painted white.

Doors, front entrance alcove, and canopy

The freight doors are Tichy 8038, trimmed as necessary and glued in place. The double waiting room door and all doors in the rear wall are Tichy 8033. The front door is also a Tichy 8033, flanked by sheet styrene. The adjacent walls, glued at right angles to the front door, comprise the alcove of the front entrance.

The canopy is constructed from .015" styrene sheet (Evergreen 9015) measuring 13/32" by 2⅛". The supports for the canopy are .100" x 0.100" styrene strip pieces (Evergreen 175) that are tapered to give a downward slant. Along the front, a .060" x .080" x 2 1/16" styrene strip (Evergreen 154) completes the canopy.

Finishing touches

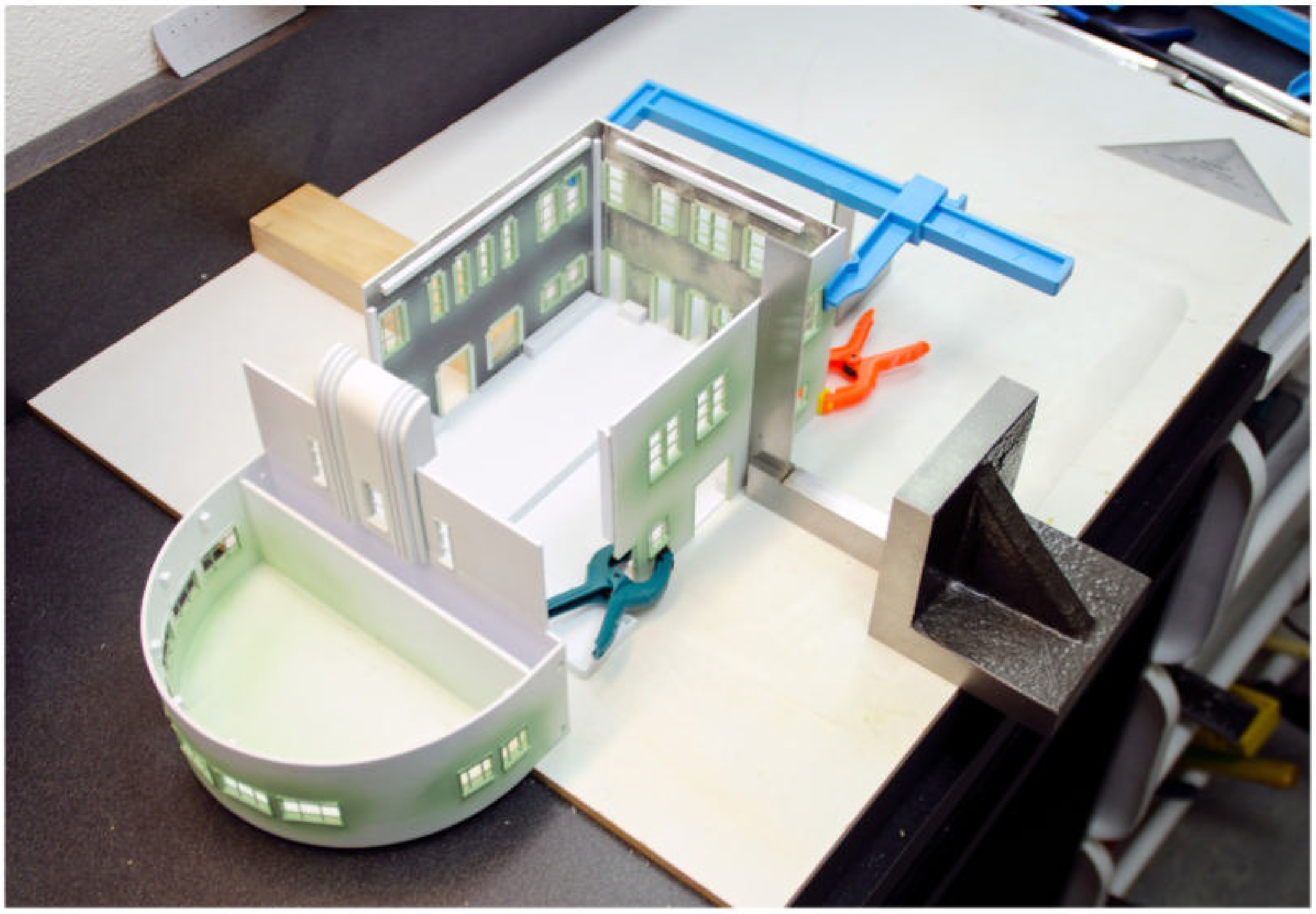
Even the station's neon sign was unique to the D&RGW. It symbolized that the railroad went through, not around, the heart of the Rockies. I was able to find a color photograph taken perpendicular to the sign. This was copied, sized, and printed on bond paper. The sign was carefully cut out and glued to .060" styrene sheet of similar shape ⑪. The three supports were constructed from .100" x .100" styrene angle (Evergreen 293). One brace is foreshortened to accommodate the curve of the roof.

The letters for the "SALIDA" name on the building are also in an art deco font. Using an enlarged photo of the depot, I carved individual letters from .015" styrene sheet. Each letter was backed by .030" x .030" square styrene strips (Evergreen 131). This permitted the letters to stand away from the building when glued in place.

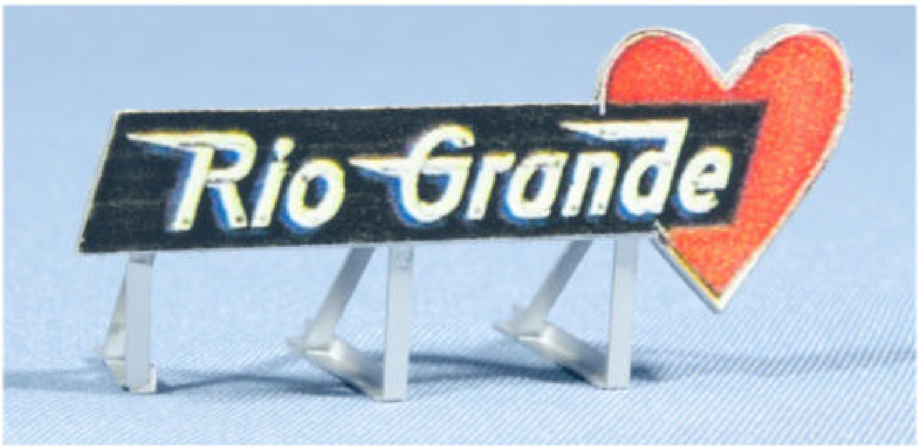
There is a top cap that surrounds the entire building. On the straight walls it is a .040" x .125" strip (Evergreen 146). For the two curved walls I cut out a circular cap ⅛" wide from .040" sheet. This was a bit laborious, but appeared to work.

There are three decorative vertical ribs above the front entrance. These are .060" x .080" strips capped by a .060" half-circle cut from styrene sheet. The window panes are .020" clear polyester sheet (Midwest Products 701-02), glued to the inside window frames. Finally, add the only non-styrene item, a ⅛" x 3⁄32" x ¾" piece of stripwood, to the edge of the elevated freight door as a bumper.

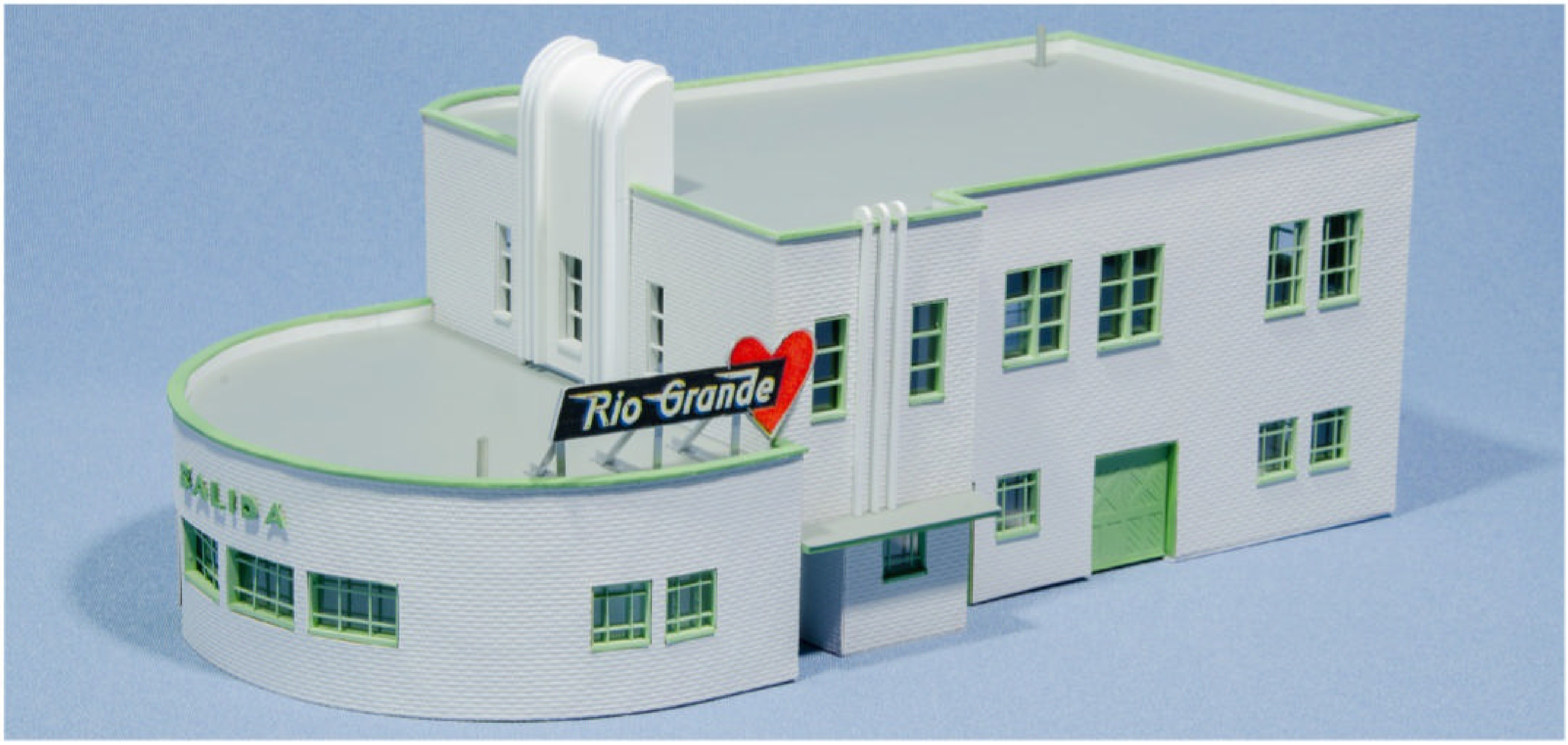
Though it was not an easy build, this completes the station ⑫. The Salida Depot invites regular comments from visitors to the layout and is my tribute to the D&RGW's rare art deco architectural adventure. MR



⑩ **Erecting flat walls.** Squares and clamps were used to ensure that building is square and plumb. The pylon is glued to the front wall.

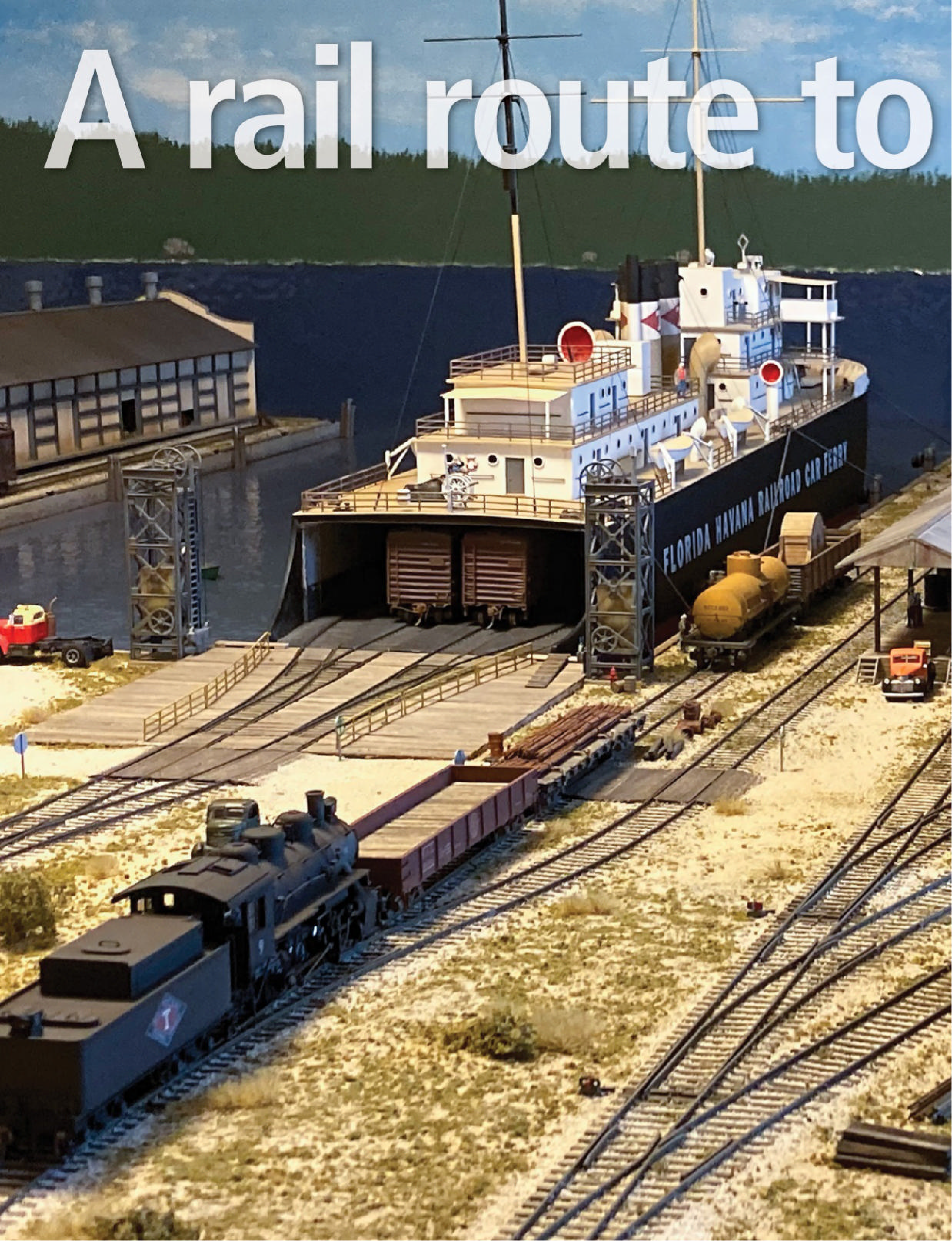


⑪ **Through the heart of the Rockies.** This is the front of the sign that sits on top of waiting room roof.

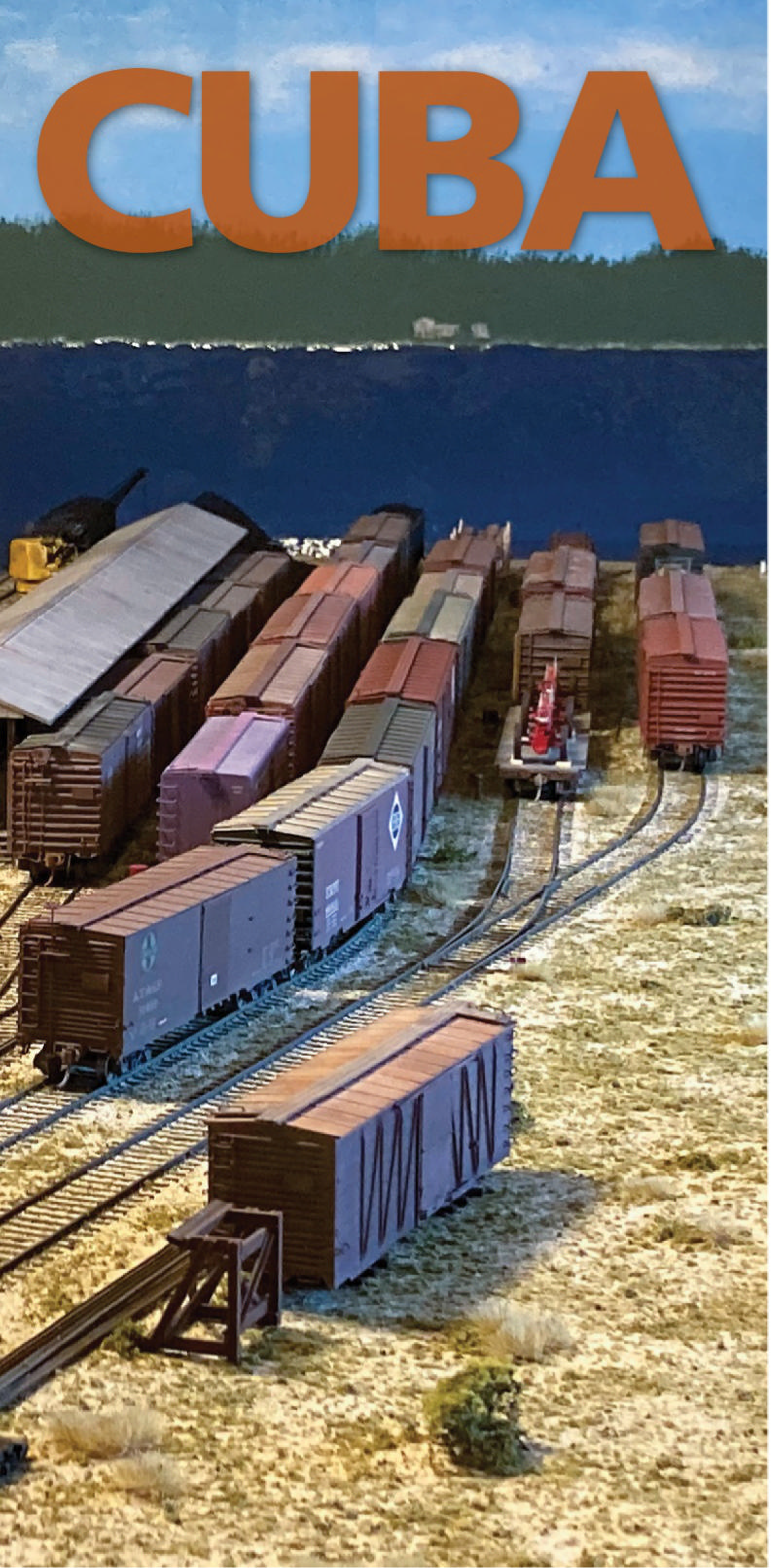


⑫ **Finished.** The Salida Depot is finished and ready for installation on Gerry's layout.

A rail route to


FLORIDA HAVANA RAILROAD CAR FERRY

CUBA



Retirement and a move make room for a port terminal layout based on childhood memories

By Bob Johnson
Photos by the author

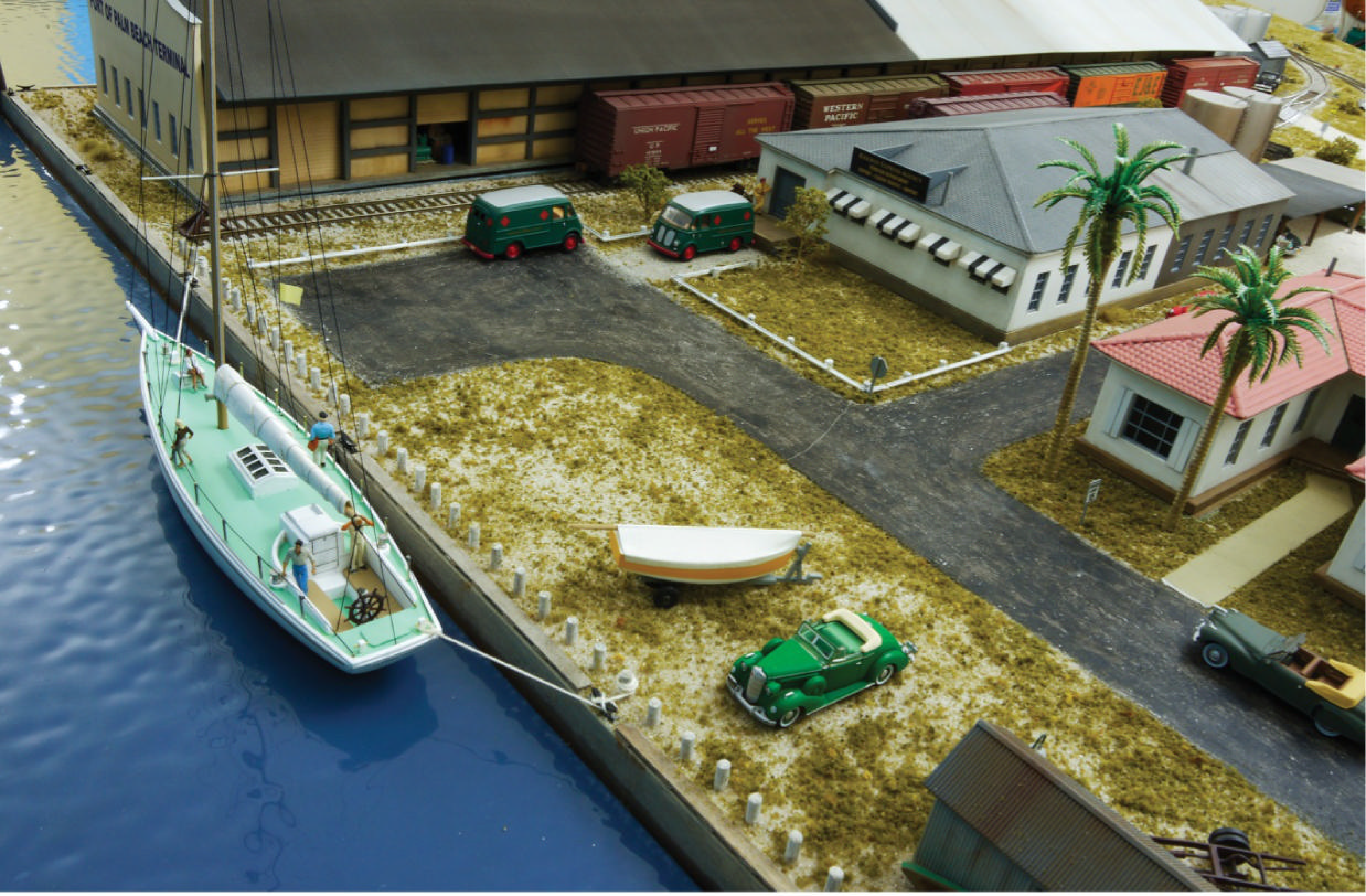
After 15 enjoyable years creating my prior layout (the Union Pacific Butte Line, featured in the May 2015 *Model Railroader*), a decision to retire and move meant that the layout had to be scrapped. After the move, when I began thinking about subjects for a new layout, a fundamental requirement was to replicate a prototype railroad's operations. I particularly enjoy the historic discovery process. I also decided that the layout subject should have a personal connection (call it nostalgia) plus be very different from anything I'd done before.

This led me to consider replicating the railroad car ferry operations at the Port of Palm Beach Terminal near West Palm Beach, Fla., in the late 1950s. I was a teenager at that time and frequently sailed my small boat in and around the port, watching the large railroad car ferries arriving and departing between the port and Havana, Cuba. The final point was that the switching operations at that time were still performed by an 0-6-0 steam engine, one of the last in commercial service in the country.

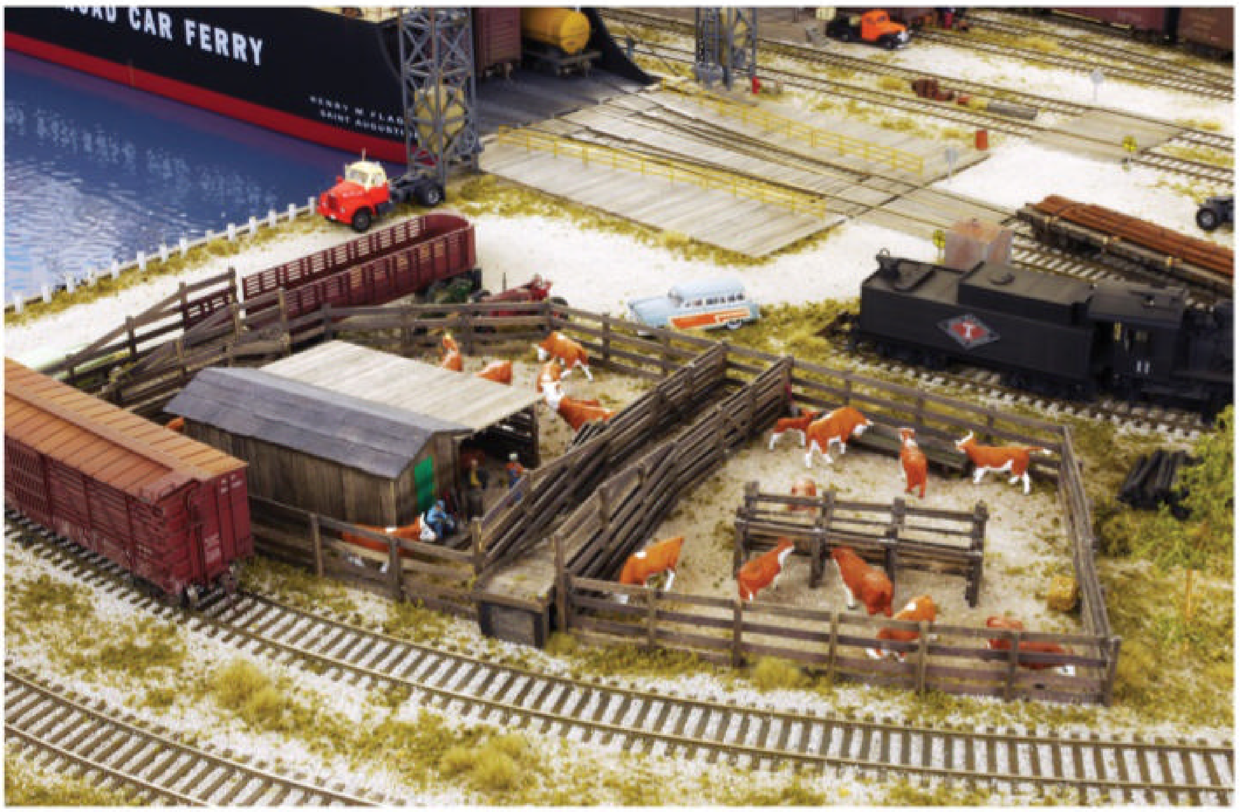
Researching the prototype

I began my research by contacting the current port's personnel for any info that might be available. I was graciously helped by a public relations person who sent me a copy of the port's 2016 Centennial book covering its first 100 years of operation. In addition, I was given the name of an individual who had taken numerous photos of the port in the '50s. An internet search allowed me to get in touch with him, and he kindly provided me with photos showing

① Engine No. 9, one of two 0-6-0 steam switchers on the prototype, works the yard on Bob Johnson's HO scale West Palm Beach Terminal Co. layout. The switching module models the port in the 1950s, during Bob's childhood.



② A sailing yacht has arrived at the terminal to clear U.S. Customs after returning from the Bahamas. Bob modeled the sailboat to represent one that he often crewed on when he was a young man. The less-than-carload lot freight transfer warehouse is in the background.

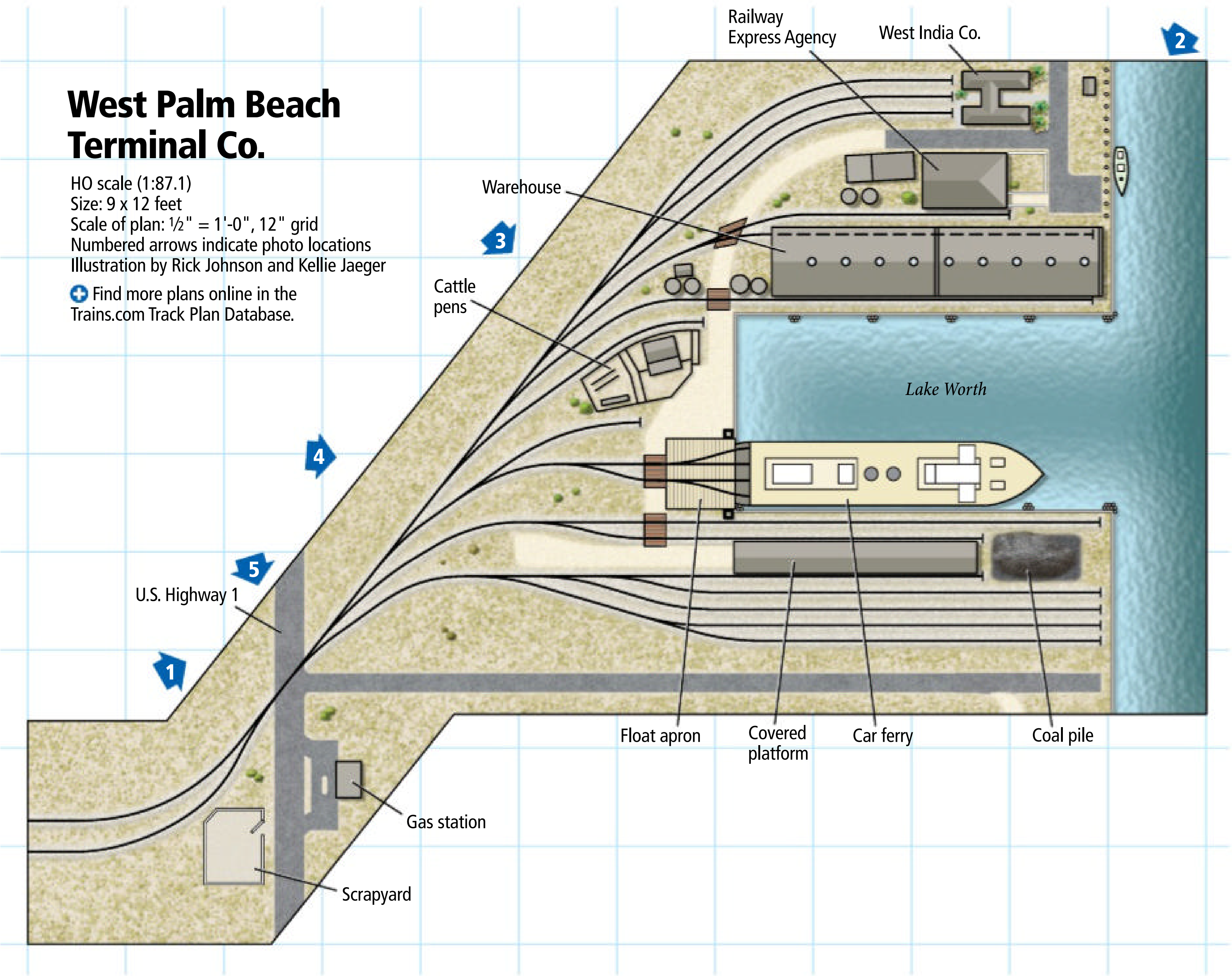


③ Cattle await loading aboard a stockcar for export to Cuba aboard the car ferry. Cattle was an active commodity in this era, as Florida was one of the largest cattle ranching states in the country.

numerous aspects of related rail and ship operations during this period. Additional info was also obtained from my web searches, but the two resources above were key in making it possible for me to reasonably replicate the facility for a layout.

The history leading up to this era of railroad car operations at the port is important and firmly connected with the history of the Florida East Coast Ry. and Henry Flagler. The story began with the FEC's construction of its Key West Extension in the early 1900s. More than 100 miles of track and numerous bridges were constructed connecting Miami to Key West, called by some "Flagler's Folly" and others "The Oversea Railroad." This completed the connection of FEC's service from Jacksonville to Key West and allowed creation of a railroad car ferry service between Key West and Havana, a significant new revenue source for the FEC and an important commercial connection between the two countries.

This extension prospered until a major hurricane in 1935 destroyed much of its track and bridges, resulting in the abandonment of the line from Miami south (and, three years later, rebuilt to become an extension of highway U.S. 1 to Key West). Florida East Coast's railcar shipping to Cuba was relocated to Port Everglades, north of Miami, soon after the hurricane. It remained there until the outbreak of



West Palm Beach Terminal Co.

HO scale (1:87.1)
Size: 9 x 12 feet
Scale of plan: ½" = 1'-0", 12" grid
Numbered arrows indicate photo locations
Illustration by Rick Johnson and Kellie Jaeger

➕ Find more plans online in the Trains.com Track Plan Database.

WWII, when all ships were requisitioned by the Navy for the war effort.

After hostilities ended, the ships were returned, but the FEC decided to sell off the railroad car shipping service to a private operator. Operations were relocated to the Port of Palm Beach, where they became the West Palm Beach Terminal Co. (rail operations between the FEC and ships) and the West India Fruit & Steamship Co. (ship transport). After Castro's takeover of Cuba, all rail shipping operations ceased in 1961. Today the port is a major container interchange facility and cruise ship port.

Planning the module

I chose to place the layout in an 11 x 12-foot room in our home and design it as a free-form module that could be moved in or out without damage. Since the terrain would be flat, I used hollow-core doors for the surface, supported by simple wood frameworks. They're light, dimensionally stable, and have worked out well. With careful construction, secure connections, and scenery in place, the module joints are not easily noticed.

While compressed to fit the space available, the track plan captures the essence of the port's facility and is conceptually faithful to the prototype. I used Micro Engineering code 70 flextrack with its No. 5 ladder track turnouts throughout, which helped make the track plan fit nicely. All turnouts are manually controlled (like the prototype) and easily reached from the fascia.

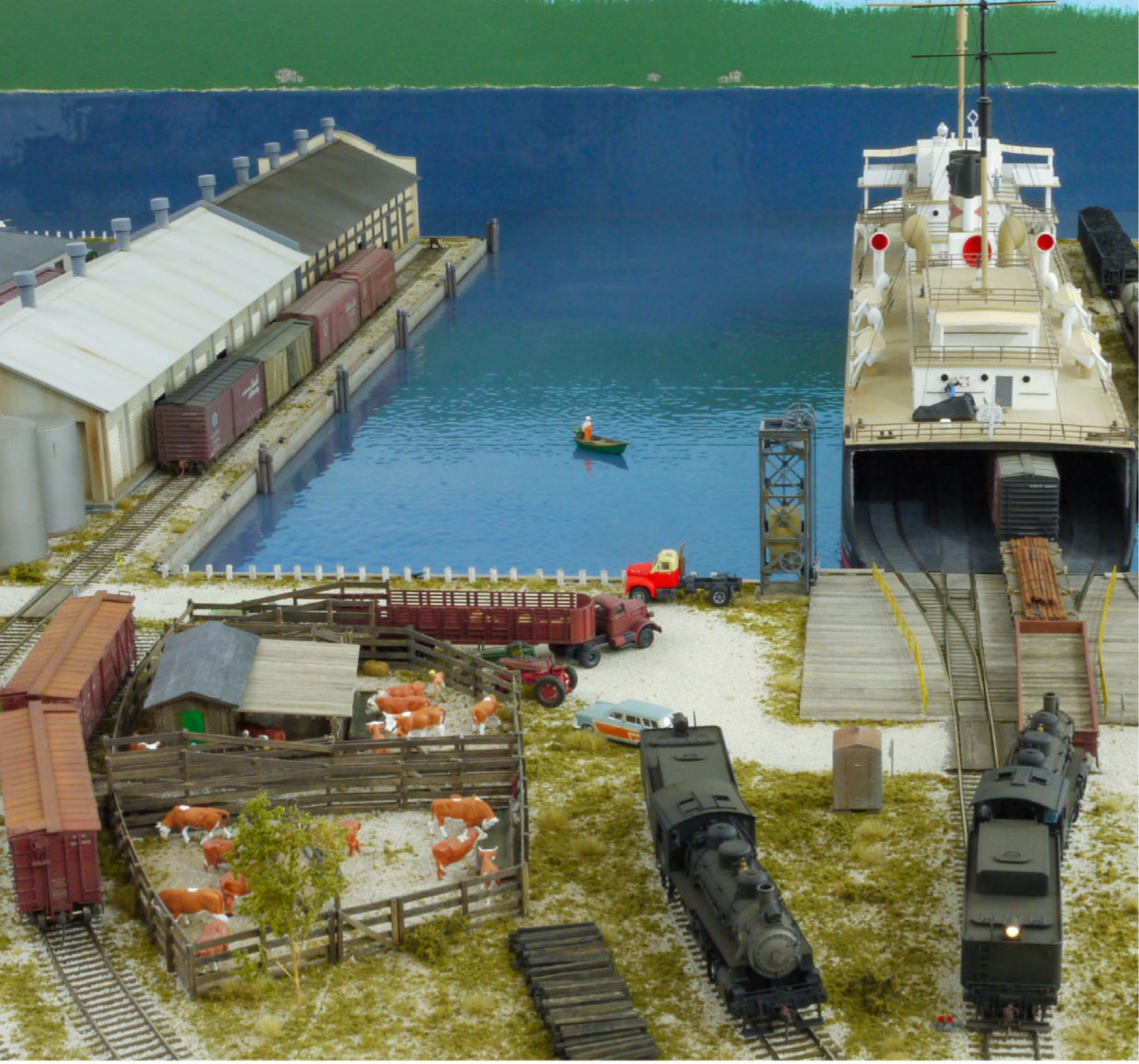
The prototype yard had two similar 0-6-0 locomotives, numbers 9 and 11, but typically only number 9 was used. Fortunately, Life-Like's Proto 2000 0-6-0 is a near match for the prototype. I found two on the internet. I added custom decals and converted them to oil as used during this time frame. Even though only one locomotive ever operates in the yard, I chose to stay with wireless Digital Command Control (DCC) for all its advantages.

Ships and structures

A centerpiece of the layout is the West India Fruit & Steamship Co.'s ship, the *Henry M. Flagler.* This ship was built in 1916 for the FEC railroad car service (Key West to Cuba) and remained in

The layout at a glance

Name: West Palm Beach Terminal Co.
Scale: HO (1:87.1)
Size: 9 x 12 feet
Prototype: West Palm Beach Terminal Co.
Locale: East coast of Florida
Era: late 1950s
Style: module
Mainline run: none
Minimum radius: 21"
Minimum turnout: no. 5
Maximum grade: none
Benchwork: hollow-core doors
Height: 45"
Roadbed: cork sheet
Track: Micro Engineering code 70
Scenery: sand, gravel, ballast, and ground foam turf
Backdrop: hand painted
Control: NCE DCC



④ No. 9 offloads the car ferry *Henry M. Flagler* after its arrival from Cuba. A two-car "handle" is used to reach the shipboard cars, allowing the locomotive to stay off the float apron. A trip to or from Cuba typically took about 24 hours.

service until the end of operations in 1961. With some help from friends plus an internet search, I was able to resource dimensional information and a number of photos, allowing me to create a reasonable facsimile of the ship.

I made the hull by first shaping a wood pattern, from which I made a fiberglass mold used to create the fiberglass hull. The interior rail deck is a plywood insert and has four tracks per the prototype, allowing about 22 cars to be loaded. The deck and superstructure are made of styrene, and many of the small details (funnels, lifeboats, etc.) were purchased from hobby supply sources. Two other similar ships made up the prototype's fleet operating out of the port in this era.

The sailboat tied up to the bulkhead near the Railway Express Agency building is a sloop that was owned in the area during the late '50s and which I sometimes helped to crew. I researched its history, which allowed me to make the model. It is shown flying a small yellow quarantine flag as the boat clears customs returning from the Bahamas. I was on board for that trip, so it's included as a personal connection.

Nearly all of the structures are scratchbuilt from styrene to replicate the prototype. I also had custom decals made for the signs on the Railway Express Agency office, Port of Palm Beach Terminal warehouse, and the ship, plus the heralds on the locomotives.

Scenery

As the historic aerial photo of the facility shows, the terrain is flat and

9
RAILROAD CROSSING

⑤ Engine No. 9 runs light across Highway U.S. 1 (also called Dixie Highway) to pick up cars from the Florida East Coast's nearby siding. All cars are handled ahead of the locomotive for better visibility. The engine is a Life-Like model.

covered in sand with scrub growth and a few trees. Our local beach sand would have worked well for the ground cover except for the prospect of some salt residue, so I probably became the first person living in Florida to ever import even more sand into the state.

I selected a blue for the water surface that is typical for the area, then coated it with a bar-top epoxy. I experimented with small samples to determine how to get the desired water surface with the epoxy. I found that at a predetermined time after application, running a paint roller over the partially cured epoxy surface created a coarse texture that gradually settled back to become realistic ripples when fully set.

I made a wide panel of the water surface and cut part of it away for use on the vertical backdrop to extend the horizon of the distant shore. The sky was made to look like a typical Florida day and was easy to make with bright blue and white paints applied with a wide paint roller. I used old photos as a reference for the backdrop, adding the narrow beach, trees, and a few homes along the water.

At the outset, I was concerned that a dedicated switching layout might not be much fun to operate. However, I've come to enjoy the process of "receiving" cars from Cuba, placing them at various dedicated spots, and reloading other cars for the next sailing. These outbound cars are loaded in a seemingly random fashion, but are actually located (per the prototype) based on their weight in order to keep the ship in proper trim both athwartship and fore-and-aft.

Being personally disinclined to spend too much time planning all this, I will randomly select cars for loading that might be expected to keep everything level. Lots of whistle blowing, bell ringing, and turnout lining is involved, and it's never the same. It's a very enjoyable new experience. MR

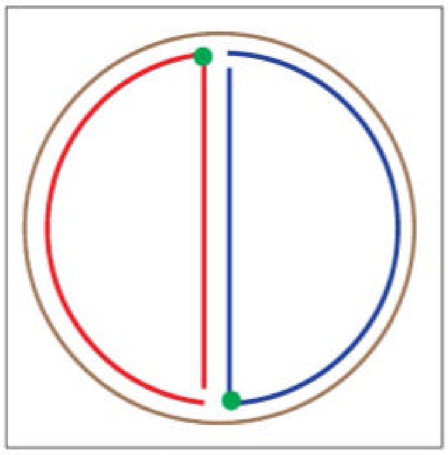
Meet Bob Johnson

Bob is a retired designer and manufacturer of pleasure boats. He's a lifelong model railroader with several articles and photos published in MR over the years. He and his wife, Jeri, live in Largo, Fla., and have a son and two grandsons.

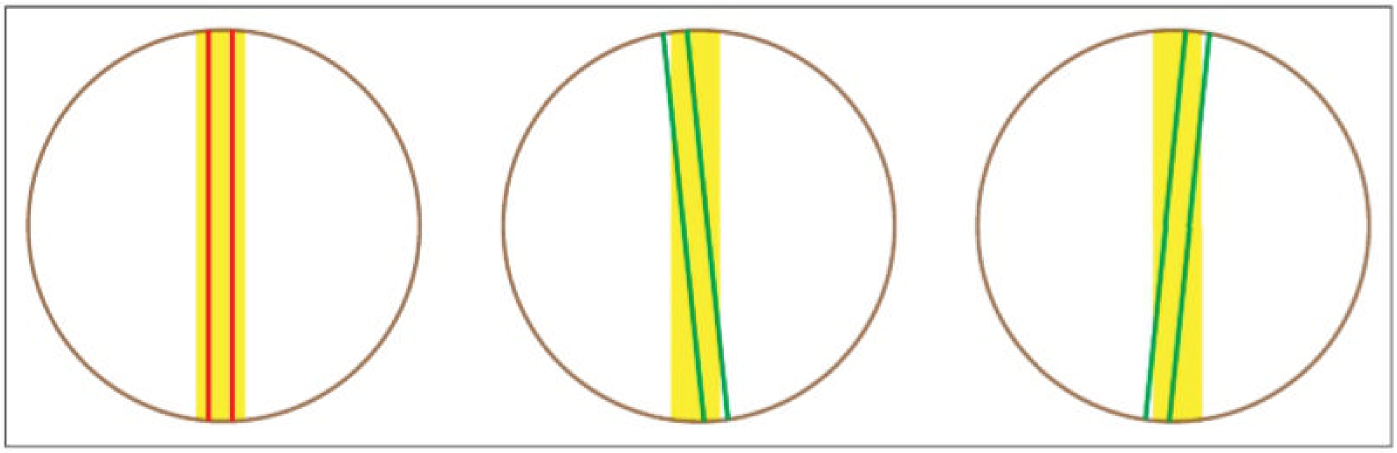
Wiring turntables

2823
CANADIAN PACIFIC

① No steam layout is complete without a turntable, right? Even if just to turn a locomotive around at the end of a branch line, they add additional animation to any layout. Alan Gartner shows how to wire a turntable for reliable operation.



② A split rim rail with wipers (shown in green) attached to bridge rails. You'll need to connect your track bus to the split rim rails.



③ The rails in red are unpowered when both are inside the dead zone in yellow. When a bridge rail goes outside of the dead zone, you'll have track power on both green rails.

Modelers love turntables and roundhouses ①. I will not cover building the turntable, but rather, I will give you ideas on powering the bridge tracks should you scratchbuild a turntable. Then I will focus on powering the tracks leading to and from any turntable, including the Walthers turntable.

As a turntable rotates, you need a way to reverse the power to the bridge for everything to work correctly. For a scratchbuilt turntable, a split rim rail will mechanically reverse your turntable's bridge power ②. Put a wiper at each end of the turntable bridge and connect it to one of the two bridge rails. You'll need to leave a gap in the split ring that is wider than your wiper. Neither wiper should be able to touch both ends of the split ring rail at the same time, or it will short out your track bus, leaving you with a small dead zone.

While the split ring rail saves the need to buy a Digital Command Control (DCC) automatic reverse section controller (ARSC) for your bridge track, I found it too difficult for my uncoordinated hands to work accurately near the inside edge of the pit. However, there are many ways you can get power to your bridge that don't involve a split rim rail. You can use a continuous rim rail to supply power to one bridge rail while using overhead power to the arch to power the other bridge rail. Just be careful not to hit them during an operating session. I've also put a wiper on the solid center shaft of the turntable to get power to a bridge rail.

You can also use a hollow center shaft and run a couple of wires through it to power both bridge rails. You can rig up a host of ways of providing wipers to these two wires.

For these methods, you'll need an ARSC to reverse the power on the turntable bridge as the locomotive goes on to and off of it.

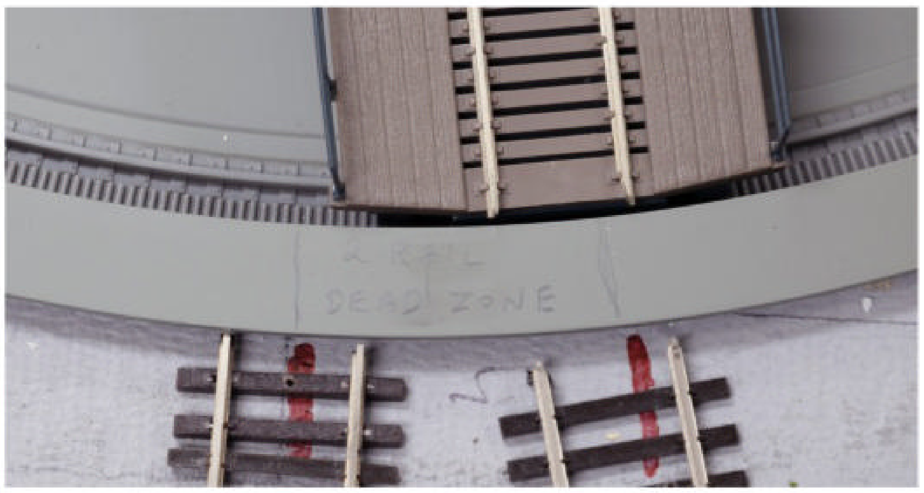
Walthers' assembled turntables have made turntables easy for any modeler. They even take care of reversing the polarity of the bridge track as it rotates; no reversing electronics required. It has a split ring with contacts under the center pivot. Whenever a split ring is used, however, you end up with a dead zone.

Whether you use a split rim rail or a Walthers turntable, when you wire it to your track bus, you may find that you have a short when your locomotive rolls onto the bridge. If so, reverse the DCC track bus wires powering the turntable rails. If your locomotive shorts when it exits the turntable on the opposite side, reverse all track bus feeders for the stall tracks. It pays to wire up just one stall track and make sure you have it right before proceeding.

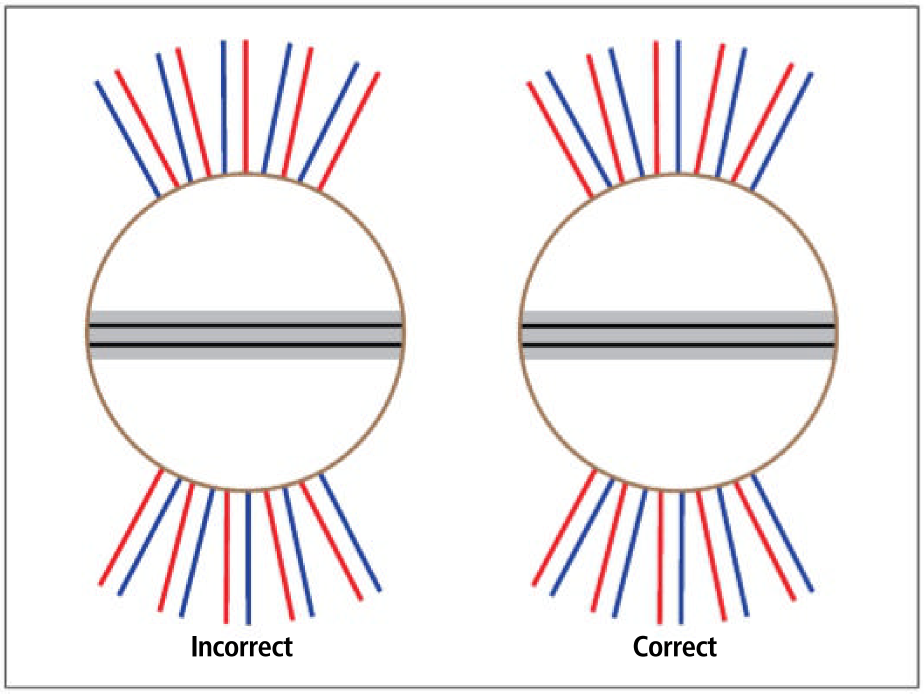
There's some mystery surrounding the dead zone. Just how big is it? How close can you get to it? To answer these, just test it. I tested a 130-foot turntable that my club is installing. We found the dead zone was a little wider than that shown on the template that comes with the turntable. Good news, though; the bridge track is only dead when both rails are inside the dead zone. When either rail is a little outside the dead zone, you'll find power on the bridge. The end result is that the area on your layout where you can't have any operable track is actually smaller than you may have thought.

The yellow band in ③ illustrates the expected dead zone. The slightly rotated rails in green show when the bridge would

GOOD NEWS THOUGH, THE BRIDGE TRACK IS ONLY DEAD WHEN BOTH RAILS ARE INSIDE OF THE DEAD ZONE.
– ALLAN



④ The pencil marks on the pit wall and the red marks on the Homasote show the dead zone. The two pieces of track were positioned where the bridge was powered.



⑤ Notice that the red rail will short to the blue rail on the opposite of the incorrect turntable when a long locomotive goes across the bridge. The correct turntable doesn't have that problem.

have power. If you lay two scrap pieces of track against the pencil marks for the outside rail ④, you'll see the dead zone isn't that big of an imposition on your track plan. I suggest planning on the dead zone to be just a bit bigger for insurance.

The wiring of the stall tracks and other tracks that lead to and from your turntable isn't complicated. If you're using a turntable with a mechanical means of reversing bridge polarity or plan on running a long locomotive over the bridge that will make simultaneous contact with service tracks at both ends of the bridge, you'll need to wire the tracks around your turntable as shown in the correct side of ⑤. Wiring the rails while alternating red and blue all the way around might initially seem like the way to go. However, for a long locomotive going all the way across, the red and blue rails will be shorted together with the opposite side. This will also not work for turntables using mechanical reversing of bridge power like the Walthers turntable or a scratchbuilt turntable using a split rim rail. With respect to the dead zone – which is horizontal in this illustration – both the top tracks and bottom tracks should alternate red, blue, red, blue.

Even if you aren't using mechanical reversing, you'll still need a "top" and "bottom" to your track plan if you will have a long locomotive crossing a small turntable bridge and are using an ARSC. For a basic installation, all blue rails of tracks going to your turntable are connected together and all red rails are connected. These are then connected to your track bus through an electronic circuit breaker.

While not essential, some modelers like to kill the track power to their roundhouse stall tracks. You could put a switch in series with one of the rails of each stall track. If you're using a Walthers turntable, you can use their Advanced Control Module (ACM) and relays to automatically power the selected stall track. For more on the ACM, see this column in the July 2021 *Model Railroader.*

Locomotives that don't have a stay-alive circuit will cut out and reset as the locomotive rotates around on the turntable. You may want to install stay-alive circuits when you install decoders in your locomotives. Enjoy your new turntable! MR

Finding the dead zone

When installing Walthers turntables, I found that keeping clear of the dead zone wasn't a problem. If you find that you need to get close to it or even encroach on the published dead zone, here's how to test your turntable.

For the Walthers turntable, connect a jumper across the DCC terminals so that you can test the dead zone. Remove the jumper when done and then connect the track bus.

1. With your DCC system disconnected from the turntable pit, put a jumper across the two terminals that you'll eventually hook up your track bus. This jumper, shown above, will make it easy to test your turntable with your handy digital voltmeter set to ohms or continuity beep. Plug the jumper into the bottom of the pit.

2. Place your turntable bridge on the turntable and inside the dead zone. You can now do one of two things. You can either use the turntable control box to rotate the bridge or move it manually. We moved our test turntable manually, but without pushing it. If you do, you will damage the plastic gear teeth. Instead, lift up on the turntable, turn it just a bit, and then put it back down.

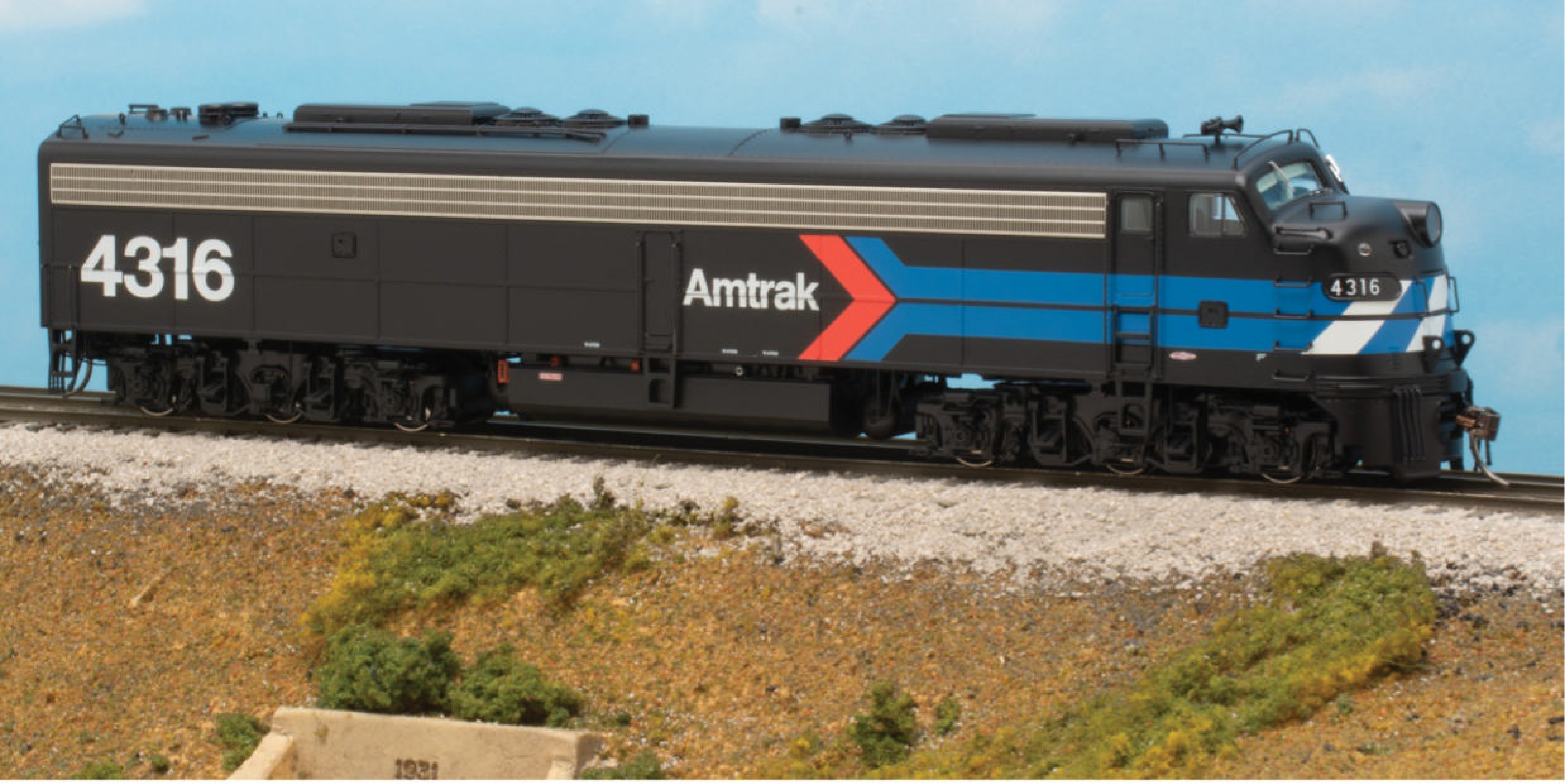
3. Now touch your ohm meter leads to the bridge track. If you get 0 ohms (your ohm meter may read a few tenths of an ohm – that's OK) or get a beep, you're good.

4. If not, rotate the bridge a little more until you get 0 ohms or a beep.

5. With a pencil, mark the rim of the turntable pit with the location of the outside bridge rail at both ends of your turntable.

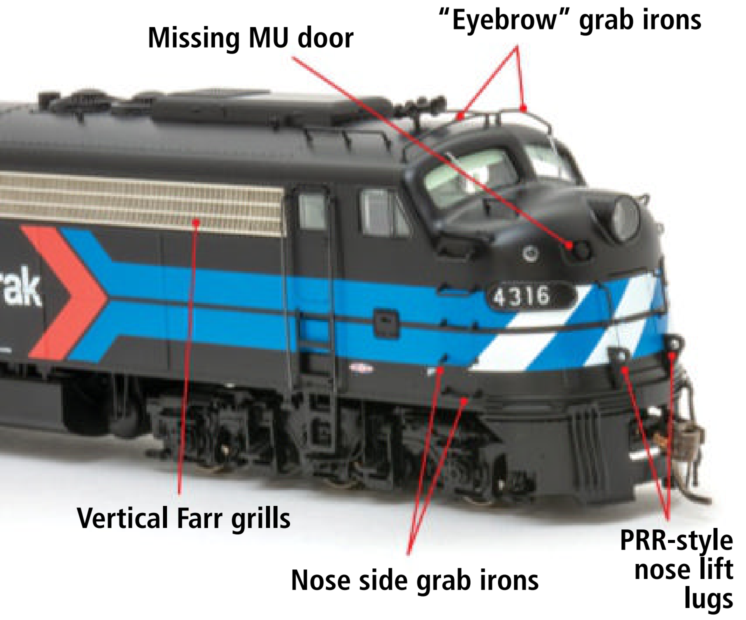
6. Then go in the opposite direction and repeat.

– *Allan Gartner*



Rapido Trains HO scale EMD E8 diesel

Rapido Trains Inc. recently released an HO scale Electro-Motive Division E8A diesel locomotive decorated as Amtrak No. 4316. The unit, painted in the passenger railroad's "day one" paint scheme, features an injection-molded plastic body, die-cast metal chassis, and numerous prototype-specific details. The passenger unit is packed in a foam-lined engraved wood presentation box that includes an enamel pin with the nose of the 4316 and a numbered certificate of authenticity signed by Jason Shron, president and CEO of Rapido Trains Inc., and Matt Donnelly, Amtrak brand communications manager.



The Amtrak "day one" E8 features many separate, factory-applied parts. The missing m.u. door matches the appearance of the 4316 on Amtrak's first day of operation.

Electro-Motive Division (EMD) produced the E8A from August 1949 to December 1953. The locomotive builder also manufactured cabless B units from December 1949 to May 1953. At the end of the production run, 421 A units and 39 B units were manufactured.

The EMD E8A was a key part of Amtrak's locomotive fleet when it began operations on May 1, 1971. The units came from several railroads, including Burlington Northern, Penn Central, Seaboard Coast Line, and Union Pacific.

The 4316 was built as Pennsylvania RR No. 5716A in November 1952. The E8 later went to Penn Central, where it was numbered 4316. The six-axle unit retained that number when it was relettered for Amtrak's first day of operation on May 1, 1971. The cab unit was the only Amtrak locomotive to be painted black with the long red-and-blue "pointless arrow" on the sides.

The 4316 stayed in the one-of-a-kind scheme for approximately a year before it was repainted in Amtrak's phase 1 colors. The unit was renumbered twice in the 1970s, first as 322 and later 461. The E8A was retired in July 1981.

Amtrak revived the day one scheme as part of its 50th anniversary in 2021, applying it to Siemens ALC-42 No. 301.

The Rapido Trains E8 features an injection-molded plastic shell and a die-cast metal chassis. The shell has numerous factory-applied parts, including Pennsylvania RR-style nose lift lugs; nose side, roof, corner, "eyebrow" grab irons; dual steam generator detail; and pilot m.u. cables.

I was especially impressed with the road-number-specific detailing, such as the missing m.u. door on the front, blanked porthole windows, etched-metal vertical Farr grills, and removed skirting above the fuel tank.

Additional features on the roof include multi-piece fans, freestanding piping, two winterization hatches, wire eyebolts, a Sinclair antenna, and a three-chime air horn.

The fuel tank is a detailed plastic casting with fillers and gauges picked in red

PERFORMANCE CHARTS

DRAWBAR PULL	
3.68 ounces	17 passenger cars on straight, level track

SCALE SPEED (DC)

VOLTS	SCALE MPH
10	1
11	9
12	27
13.2	57

SCALE SPEED (DCC)

SPEED STEP	SCALE MPH
1	0.6
7	10
14	34
21	71
28	76

and silver paint. Air tanks bookend the fuel tank.

The truck castings are multi-piece plastic assemblies with separate brake cylinders, spring hangers, and Hyatt bearings. A raised General Steel Industries logo is located above the middle axle on each sideframe.

The model's dimensions closely match drawings published in the *Guide to Electro-Motive E and F Units* by Jeff Wilson (Kalmbach Media, 2022).

To separate the shell from the chassis, I removed the front coupler and draft-gear box. Then I gently spread the shell and lifted up.

A metal weight accounts for most of the model's 1 pound, 5.8 ounces. The motor with dual flywheels is seated in the middle of the chassis.

A large printed-circuit (PC) board is attached to the top of the weight. At the front of the board is a bank of two- and four-pin connectors used for the truck contacts and front lighting features.

Behind the connectors are an assortment of contact pads. Two contact pins on a PC board attached to the inside of the shell complete the circuit to illuminate the detailed cab interior.

The ESU LokSound V5 sound decoder is located near the center of the board. The downward-facing speaker is positioned above the rear truck.

The six-axle passenger locomotive has a dual-mode ESU LokSound 5 sound decoder. I used an Athearn power pack to do the direct-current testing. The sounds came on at 8.2V, and the model started moving at 1 scale mph at 10V. The model achieved a top speed of 57 scale mph at 13.2V.

The diesel rumble sound effect works in DC. The lighting effects are limited to the headlights, ground lights, and number boxes.

I turned to an NCE Power Cab for the DCC testing. At step 1 the model crawled along at less than 1 scale mph. The E8A achieved a top speed of 76 scale mph. The speed range for full-size E8s ranged from 85 to 117 mph depending on the gear ratio. The model's speed range can be fine tuned using configuration variables.

The full range of sound and light functions can be enjoyed with DCC. To replicate the smooth start of the prototype, the decoder is factory-programmed with starting momentum. When you advance the throttle from a stop, there's a brief delay before the locomotive starts moving. To disable that feature, change CV3 to 00.

I then took the E8 over to our Milwaukee, Racine & Troy staff layout. The cab unit looked good on the 30" radius curves. The six-axle passenger unit had no problem navigating the many turnouts in Bay Junction while traveling in forward or reverse.

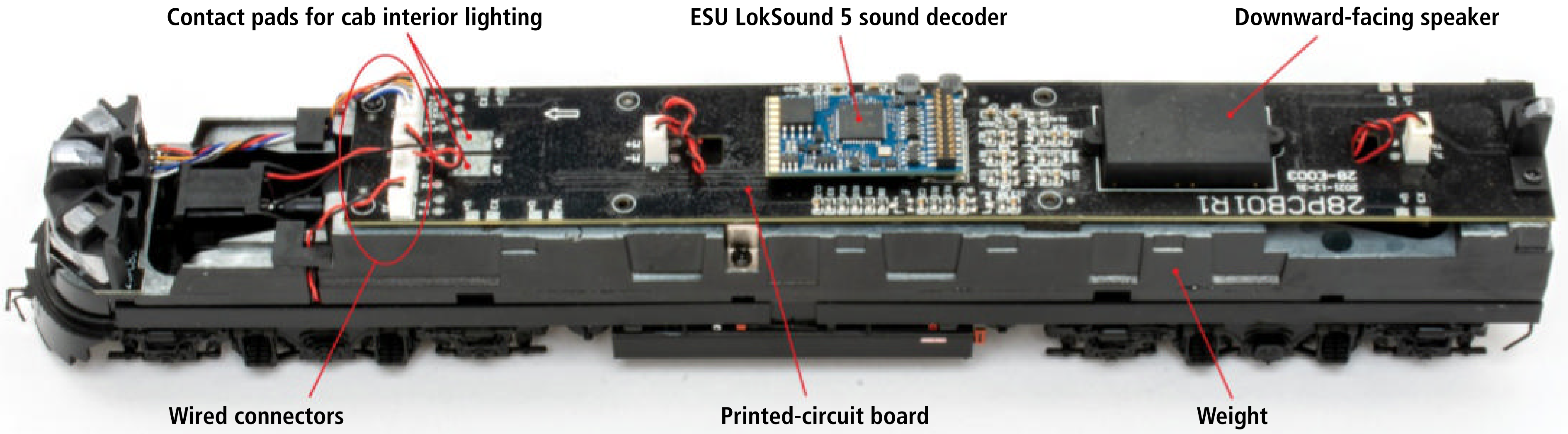
Facts & features

Price: $399.95
Manufacturer
Rapido Trains
500 Alden Rd., Unit 21
Markham, ON L3R 5H5 Canada
rapidotrains.com
Era: 1971
Road name: Amtrak ("day one" paint scheme). One road number.
Features

- Correctly gauged wheels
- Enamel pin featuring nose of locomotive
- Foam-lined wood presentation box
- Metal knuckle couplers, .010" low on front
- Road-number-specific details
- Signed and numbered certificate of authenticity
- Weight: 1 pound, 5.8 ounces

With a drawbar pull of 3.68 ounces, the E8 can pull 17 passenger cars on straight and level track. The locomotive easily pulled an eight-car passenger train (seven 85-foot cars and one 72-foot car) up the 3% grade between Bay Junction and Skyridge.

Rapido Trains pulled out all the stops on Amtrak E8 No. 4316. I appreciated the attention to detail, such as the missing m.u. door cover, blanked portholes, and dual steam generators. The wood box, signed certificate of authenticity, and enamel pin were all icing on the cake. – *Cody Grivno, senior editor*


Contact pads for cab interior lighting
ESU LokSound 5 sound decoder
Downward-facing speaker
Wired connectors
Printed-circuit board
Weight

A large metal weight and a printed-circuit (PC) board fill most of the space under the hood. The ESU LokSound 5 sound decoder and downward-facing speaker can be seen on the PC board.

6538
6538
BURLINGTON NORTHERN

Broadway Limited HO scale EMD SD45

An accurate, well-detailed model of a second-generation freight diesel has been added to Broadway Limited Imports' Paragon4 line. The sound-equipped locomotive is not only a powerful puller, but also a good-looking model, with plenty of wire and etched-metal details. The Paragon4 Digital Command Control sound decoder is loaded with a ton of sound and lighting effects and includes a built-in capacitor stay-alive module.

More power. Electro-Motive Division's SD45 was an attempt to wring more horsepower from a hood unit by increasing the company's venerable 645E diesel engine from 16 cylinders to 20. The locomotive delivered 3,600hp, an improvement over the 3,000hp SD40 series. The new locomotive was a best-seller for its first few years, being snapped up by Burlington Northern; Union Pacific; Atchison, Topeka & Santa Fe; Southern Pacific; Southern Ry.; and Pennsylvania RR, among others.

But before long, owners began reporting reliability problems. The crankshaft was prone to failure, and maintenance of the engine and the big radiators proved pricey. Sales of the series dropped off, even after EMD addressed some of the maintenance issues with the SD45-2. A total of 1,260 SD45s were sold. Electro-Motive Division abandoned the 20-cylinder experiment, going back to 16 cylinders for the 645F engine in the SD50 series and the 16-cylinder 710G engine for the models that came after.

Many SD45s forged on in revenue service until the 1990s and early 2000s, some of them having been rebuilt with 16-cylinder engines. A few are preserved at museums around the country.

Our review sample is decorated as Burlington Northern No. 6538. This diesel was built in August 1971 under order 5773-41. It was sold to railroad leasing company GATX in late 1986, then to National Railway Equipment in early 1987. It became Wisconsin Central Ltd. No. 6538 in early 1988, was renumbered to WC No. 7524, then finally retired in December 2006 and scrapped.

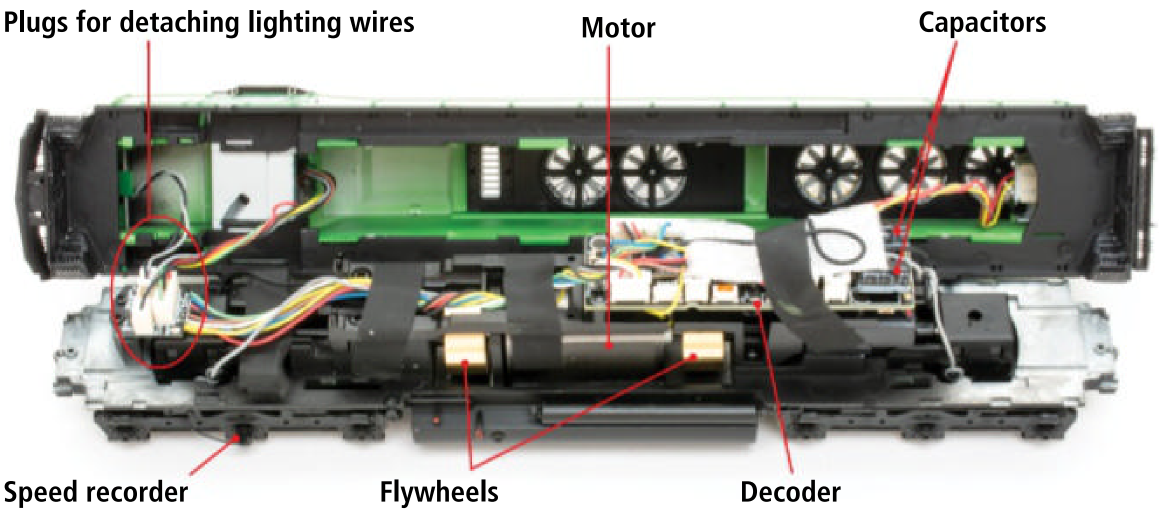
First look. The body shell is smoothly painted and crisply printed in green, black, and white. The color separation line between the two main body colors is straight and sharp. The white lettering is opaque, straight, and legible under magnification. There was a patch of bubbling in the paint on one side of the fuel tank.

The locomotive is loaded with wire and etched-metal details, including grab irons, windshield wipers, fans, fan grills, and lift rings.

I compared measurements of the model to dimensions on a builder's diagram published in the book *Burlington Northern Railroad Locomotives* by Robert C. Del Grosso (Great Northern Pacific Publications, 1999). They all matched. The model also resembled photos of the prototype I found both in that book and online. Details and markings were all spot-on.

The model's blackened metal wheels, all of which pick up current from the rails, were in gauge. The metal knuckle couplers were likewise mounted at the correct height.

After removing the front and rear couplers, I was able to disengage the four tabs behind the cab and near the back of the long hood that held the shell to the frame. The beefy-looking can motor sat low in the frame, flanked by brass flywheels. The decoder was attached to the frame above it; the capacitors for the GoPack stay-alive module were integral to the decoder. Bundles of wires led to the light-emitting-diodes in the front



The motor and dual flywheels are nestled within the die-cast-metal frame. The shell can be detached from the frame by unplugging the lighting wires.

and back of the shell. The wires were attached to the board via plugs, so they can be detached if you need to remove the shell for weathering or repainting.

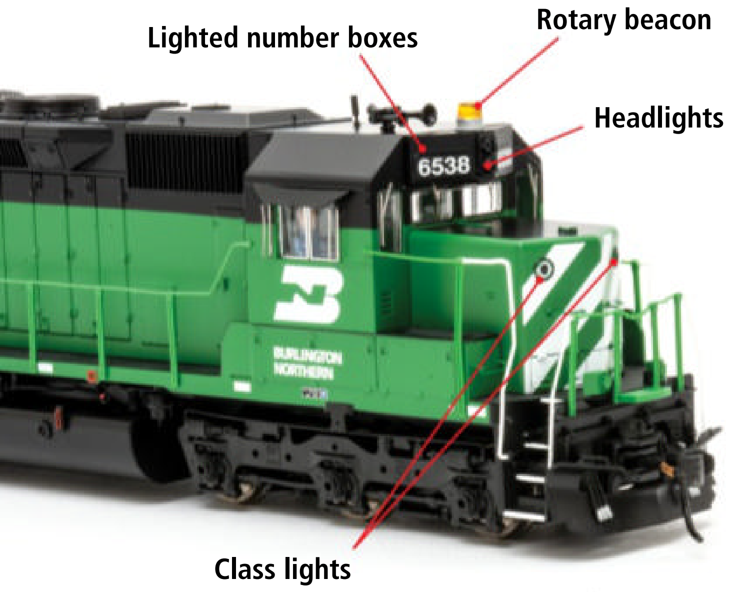
Test time. The locomotive is equipped with a dual-mode Digital Command Control sound decoder, meaning it can run under either DCC or direct current. I tested it first with DC.

The engine played its startup sequence when the throttle hit 9V. When the throttle reached 10V, the model started rolling at 2.7 scale mph. The speedometer topped out under DC at 48 smph, rather slower than the prototype's typical top speed of 71 mph. That was at our DC power pack's peak voltage of 13.5V, which means that under DC, the locomotive has a 3.5V operating range. That's pretty typical for today's dual-mode sound decoders.

Other than the diesel engine, which realistically ramped up and down with the locomotive's speed, the decoder played only one other sound effect under DC – a brake squeal that played when I quickly reduced the throttle.

More sound effects are available from Paragon4 decoders under DC using the DC Master control box, also sold by BLI. This module, which is wired between the power pack and the track, lets you play the horn and bell and set the volume.

Under DCC, I had a broader range of speed control. At speed step 1, the locomotive started out at 2.3 smph. The engine reached 76 smph at speed step 28, fairly close to the prototype's top speed. The speed curve is slightly concave, giving finer control of the engine's speed on the low end of the scale.



The Paragon4 decoder in the HO scale SD45 has a Pro Lighting Mode that lets the operator control the headlight, class lights, rotary beacon, and illuminated number boxes separately.

PERFORMANCE CHARTS

DRAWBAR PULL	
3.7 ounces	
51 free-rolling HO scale freight cars	

SCALE SPEED (DC)

VOLTS	SCALE MPH
10	2.7
11	12
12	24
13.5 (max)	48

SCALE SPEED (DCC)

SPEED STEP	SCALE MPH
1	2.3
7	12
14	21
21	46
28	76

Sounds and lighting effects were of course more plentiful under DCC, as well. In addition to the bell (Function Key 1, or F1) and horn (F2), other function keys play a coupler clank sound, activate the dynamic brake, and rev the prime mover sounds up and down.

Paragon4 decoders have two function key modes: Standard Mode and Pro Mode. Our sample came programmed to default to Pro Mode, under which different function keys let me separately control the front and rear lights, class lights, rotary beacon, and number box lights, as well as dimming the lights. Under Standard Mode, these same keys triggered various sound effects instead. Switching between the two modes is as simple as programming a value of 1 (Pro) or 2 (Standard) into Configuration Variable (CV) 128.

Another exciting feature of Paragon4 decoders is Rolling Thunder. Decoders equipped with Rolling Thunder broadcast the low frequencies of their sound effects to a special receiver that plugs into a subwoofer. It's a thrill to feel the floor vibrate with the bass as the diesel engine ramps up. It really adds to the feel of realism. (The people in the offices one floor below the MR workshop probably aren't fans, though.) Rolling Thunder works whether you're controlling the locomotive under DCC or DC.

Our force meter recorded the model's peak drawbar pull as 3.7 ounces, enough to pull 51 free-rolling 40-foot freight cars on straight and level track. No layout is made of purely straight and level track, though. In a real-world test on our HO scale house layout, the Milwaukee, Racine & Troy, the SD45 took the curving 3% grade out of Bay Junction like a champ, lugging 10 not-entirely-free-rolling 50-foot boxcars behind.

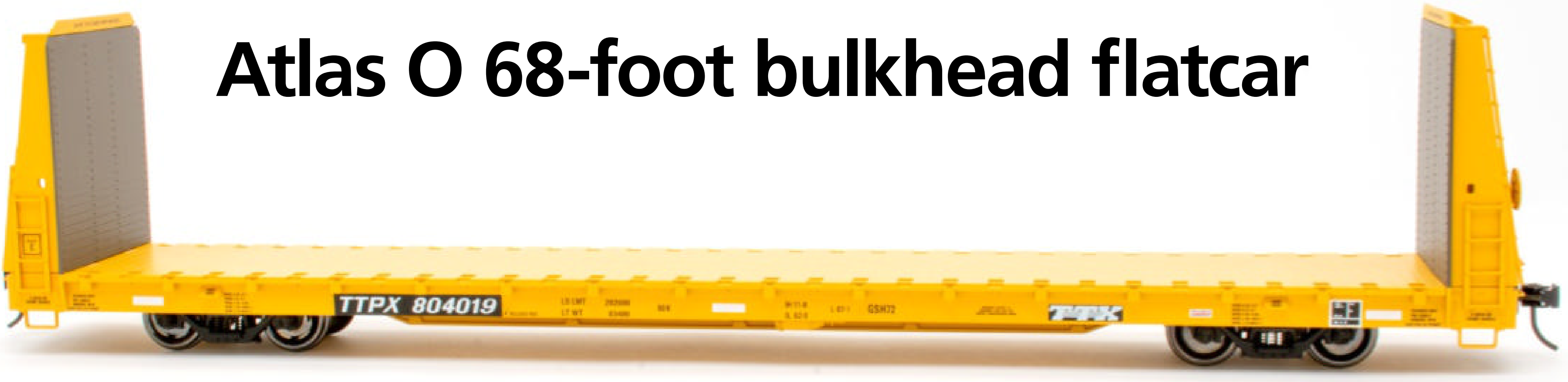
Facts & features

Price: $399.99
Manufacturer
Broadway Limited Imports
9 East Tower Circle
Ormond Beach, FL 32174
broadway-limited.com
Era: 1965 to present
Road names: Burlington Northern (green and black); Atchison, Topeka & Santa Fe (freight warbonnet scheme); EMD demonstrator (blue and white, one number); Norfolk & Western (black); Pennsylvania RR (Dark Green Locomotive Enamel); Southern Pacific (bloody nose); Southern Ry. (tuxedo scheme); and Union Pacific (Armour Yellow and Harbor Mist Gray). Two road numbers each unless noted; also available undecorated.
Features

- Blackened metal wheels with all-wheel electrical pickup, in gauge
- Etched-metal radiator fans and grills
- Light-emitting-diode lighting with Pro Lighting Mode for individual light control
- Macro-recording capability
- Metal couplers, at correct height
- Minimum radius: 18"
- Paragon4 dual-mode Digital Command Control sound decoder
- Prototype-specific trucks and other details
- Road name-specific lighting (Mars light, rotary beacon, and/or emergency light)
- Stay-alive capacitor module
- Weight: 15.1 ounces
- Wire grab irons, lift rings, and other details

A hard worker. Broadway Limited Imports' HO scale SD45 is a sharp looking, well detailed, and accurately designed model that would look great in a multi-unit lashup on the front of a long drag freight or intermodal train. Their long lifespan means almost any diesel-era layout set after 1965 could host one. And the model's pulling power, great sound effects, and smooth motor mean you won't regret the purchase. – *Steven Otte, senior associate editor*

Atlas O 68-foot bulkhead flatcar



Atlas O has released a new run of 68-foot bulkhead flatcars in its Trainman line. The modern flatcar comes in multiple paint schemes and road numbers to suit the transportation needs of any O scale railroad.

Our sample is decorated as TTPX 804019, part of the leasing company's 804000 through 804399 series built by Gunderson between April and June 1997. The Plate C cars were designated as TTX class GSH72. Uniquely, these cars were the first TTPX cars to be equipped with 110-ton swing-motion trucks.

As built, the GSH72 bulkhead flatcars had a wood bulkhead face and a nailable steel deck. There were 16 stake pockets, 31 recessed lading anchors, and 15 retractable lading anchors installed on each side. The bulkheads were to be removable and replaceable by mechanical means or welding.

These cars were built to be versatile and as such have carried everything from spools of wire to stone to pipes. One major use of bulkhead flatcars is for steel transportation. With a high load limit, plenty of lading anchors, and bulkheads to protect shiftable loads, bulkhead flatcars became a favorite steel hauler for customers and railroads alike.

The Atlas O Trainman model of this flatcar faithfully represents the heavy hauler with molded and separate, factory-applied details and accurate paint and lettering. The top of the plastic deck simulates the nailable steel floor with appropriate grooves every 9 scale inches. There are 16 stake pockets on each side, allowing for modeler-supplied stakes to be installed on the car.

Also molded on each side of the deck are 31 recessed lading anchors and 15

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retractable lading anchors. On the inside of each bulkhead is a brown face with molded wood boards and raised bolt detail. Plastic ladders and grab irons are separate, factory-applied parts located in the correct positions on each bulkhead. A plastic brake wheel and simulated chain are placed appropriately on the B-end of the car, and plastic see-through crossover platforms are applied just above the couplers on each end.

The underside of the car features the same simulated nailable steel floor detail on top of the car's all-metal fish-belly center sill and cross members. Some brake system details are freestanding, including the air reservoir, control valve, and brake cylinder. The sprung, die-cast metal trucks are screw-mounted to the frame and rotate freely. Each truck features metal wheels and axles with rotating roller bearing caps. Plastic draft-gear boxes, body-mounted to each end of the car, are fitted with metal knuckle couplers with trip pins.

All of the paint was smooth, and the lettering and heralds were crisp and legible, even the small Built in Oregon by Gunderson builder's stencil on each side. The lettering and herald placement follow prototype photographs. The capacity and dimensional information on the car matched TTX Co. Specification 68-05-961021. The model is also available decorated for BNSF Ry. (Mineral Red) and General American Marks Co. (blue).

Our sample weighed 20.3 ounces, about 2 ounces less than the National Model Railroad Association Recommended Practice (RP) 20.1 of 22 ounces. The metal knuckle couplers were mounted at the correct height, and the metal wheels were in gauge. The car, which has a minimum radius of 36", rolled freely on O scale track.

Bulkhead flatcars can be found on mixed freights all over North America, carrying a variety of loads. If you have anything that needs to be delivered on an unconventional piece of rolling stock, this car makes a perfect addition to your fleet. – *Bryson Sleppy, associate editor*

Facts & features

Price: $62.95

Manufacturer

Atlas Model Railroad Co.
378 Florence Ave.
Hillside, NJ 07205
shop.atlasrr.com

Era: 1997 to present as decorated (varies depending on paint scheme)

Road names: BNSF Ry. (Mineral Red), General American Marks Co. (blue with GAEX reporting marks), and TTX (yellow with black herald and TTPX reporting marks, or yellow with Forward Thinking logo and TTPX reporting marks). All road names offered in multiple road numbers. Also available undecorated.

Features

- Metal wheelsets, in gauge
- Metal knuckle couplers, at correct height
- Minimum radius: 36"
- Weight: 20.3 ounces (about 2 ounces less than NMRA RP 20.1)

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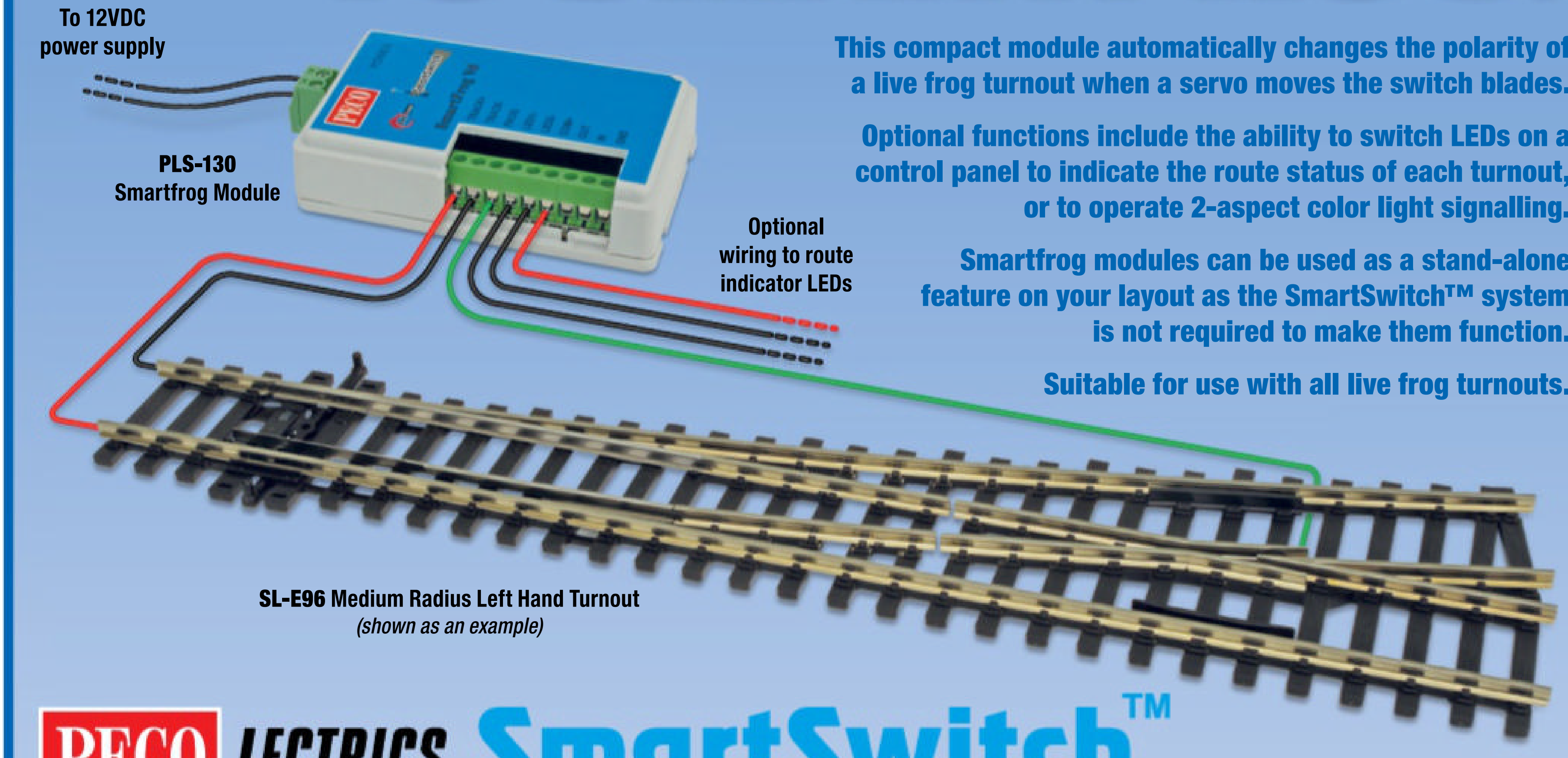
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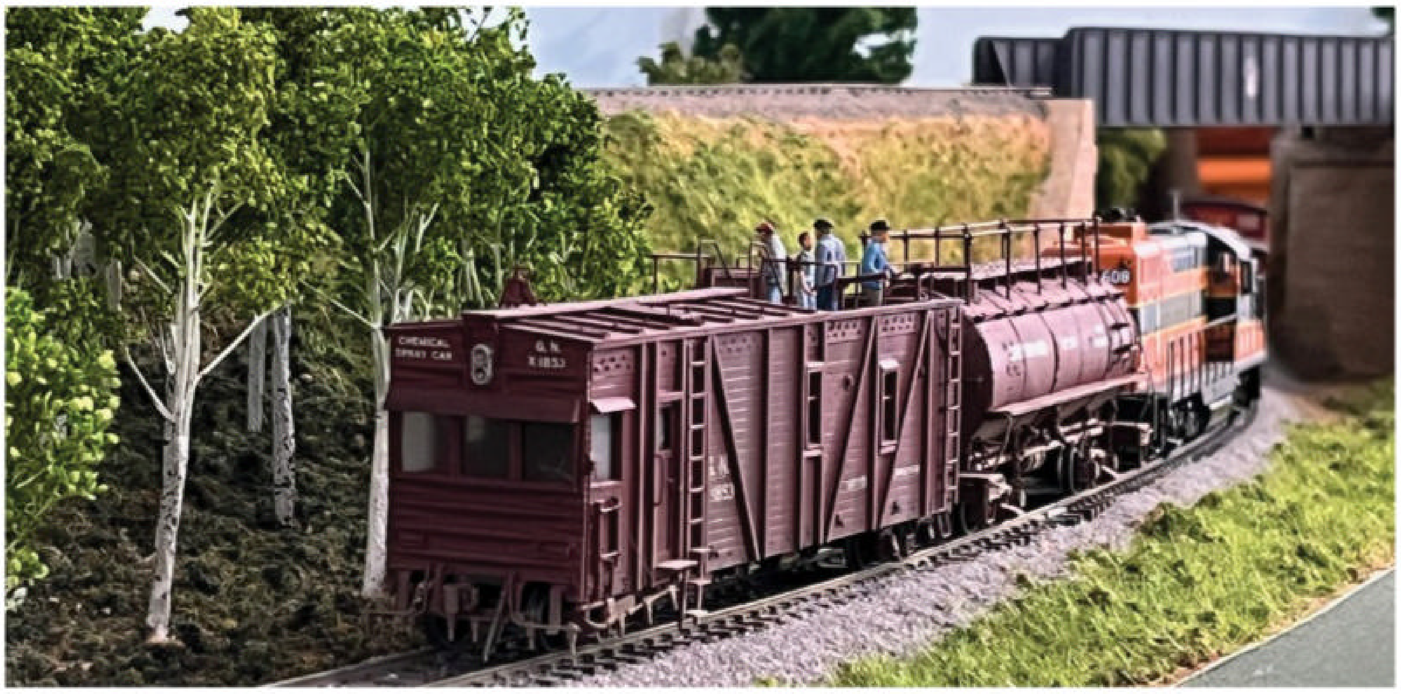
By Jerry Dziedzic

Not protecting, except...



Maintenance-of-way activities don't often appear on model railroads. A work extra train order allows this weed sprayer equipment to move slowly and do its job with minimal disruption to other traffic on the line. Bob Hanmer photo

Two distinctive models and their purpose inspired Bob Hanmer to add an interesting element to operating sessions on his Great Northern Mesabi Division layout, which depicts the area around Grand Rapids, Minn., in 1958. The models are a weed sprayer and the tank car which supplies it, both offered by the GN Railway Historical Society almost 15 years ago. The way he worked them into his sessions makes a good case study in the nuances of train-order methods.

Vegetation control is important to most modes of transportation. Train crews rely on clear view of signals, mileposts, and right-of-way signs; crews and drivers both need open views at grade crossings. Sprouts from grain spillage and other seeds take root between ties, as barren as a rocky ballast and subroadbed might seem. Uncontrolled vegetation can cause wheel slipping, interfere with water drainage from the track structure, and become a fire hazard when it dries.

Bob issued a summer weed control program. The memo lists the locations where the weed sprayer outfit will work and their dates so dispatchers and other employees can plan for its movements. The first part of the sprayer train order reads Eng 608 works extra two thirty 230 PM until six thirty 630 PM between Gunn and Bovey not protecting against extra trains. Test yourself: what movement authority does this give the train?

The phrase works extra distinguishes the train's movements from run extra. It provides for the train to be anywhere between the two points named, Gunn and Bovey. Work Extra 608 can move back and forth in both directions; it can proceed to Bovey and return to Gunn or any intermediate point. This allows it to spray a main track and then back up on it to treat an adjoining passing siding or sidetrack. Run extra between the same points would require it to move from one to the other in only one direction.

The condition not protecting against extra trains relieves Work Extra 608 from Rule 99 flag protection. This makes work practical because flagging would slow the train's movements, limiting it to the speed a flagman can walk. Leaving one flagman at Gunn and running ahead to Bovey to post another is an alternative, but the running times required leave less time for spraying.

The remainder of the order adds another important condition: except protects against Extra 309A West after four thirty 430 PM two Extras 555 and 610 East after five thirty 530 PM. This indicates the dispatcher's plans to move three other trains between Gunn and Bovey while the weed outfit is working. Summing up, the spray train can roam freely between Gunn and Bovey for two hours, between 2:30 p.m. and 4:30 p.m. It must flag against Extra 309A West after 4:30 p.m. Flagging can suspend between the time Extra 309A West passes and 5:30 p.m., when Rule 99 protection must resume for the two extras east.

What is missing from all this? The order relieves the work extra from flagging against extra trains, but it doesn't suspend its duty to protect against regular trains. The timetable lists these trains, unlike the three extras the order names, so Work Extra 608's conductor will know when to expect them.

Remember, Rule 99 applies on the main track. If Work Extra 608 is treating a weed-choked siding with switches lined for the main or its conductor decides to run to another where his train can clear, flagging is not necessary because the train is safe from main track movements.

What does the order require of the other extras named? It warns them of the work extra's presence, and not protecting against extra trains notifies them it will not have flag protection. This prohibits Extra 309A West from entering the work limits between Gunn and Bovey until 4:30 p.m., after which the work extra must begin protection. Both extras east must wait outside the limits until 5:30 p.m.

Realistic operation demands the same complex reasoning the prototype requires, whether under timetable and train order or contemporary rules. However, unraveling an order's use of specific phrases and understanding their meanings can have a crew proceed confidently.

REALISTIC OPERATION DEMANDS THE SAME COMPLEX REASONING THE PROTOTYPE REQUIRES.
– JERRY

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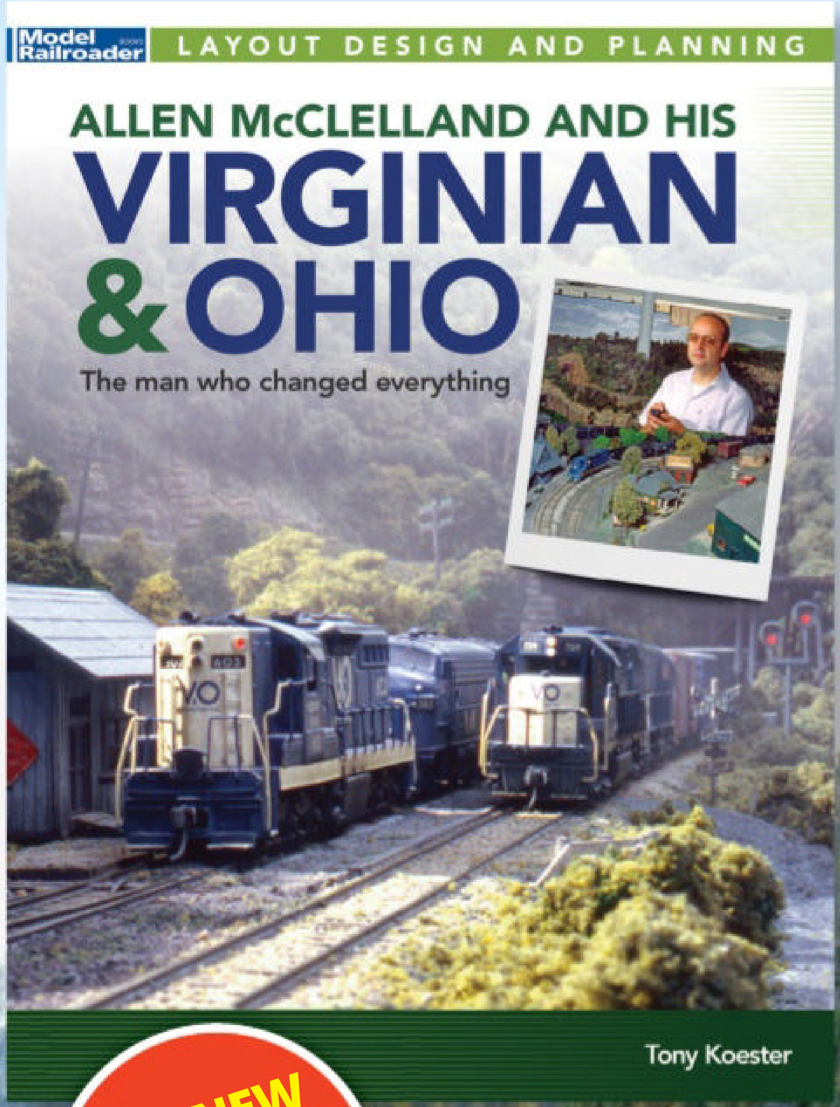
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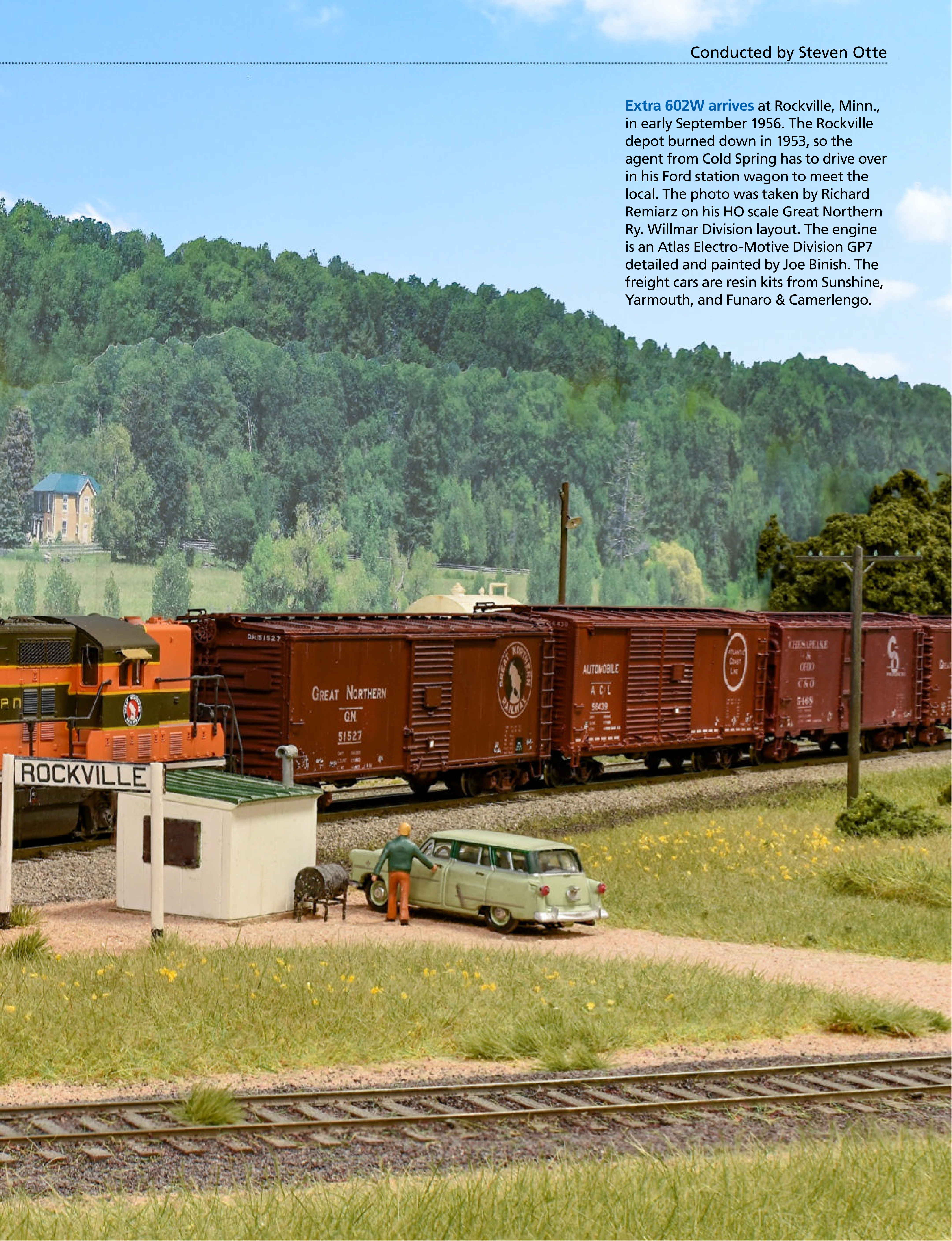
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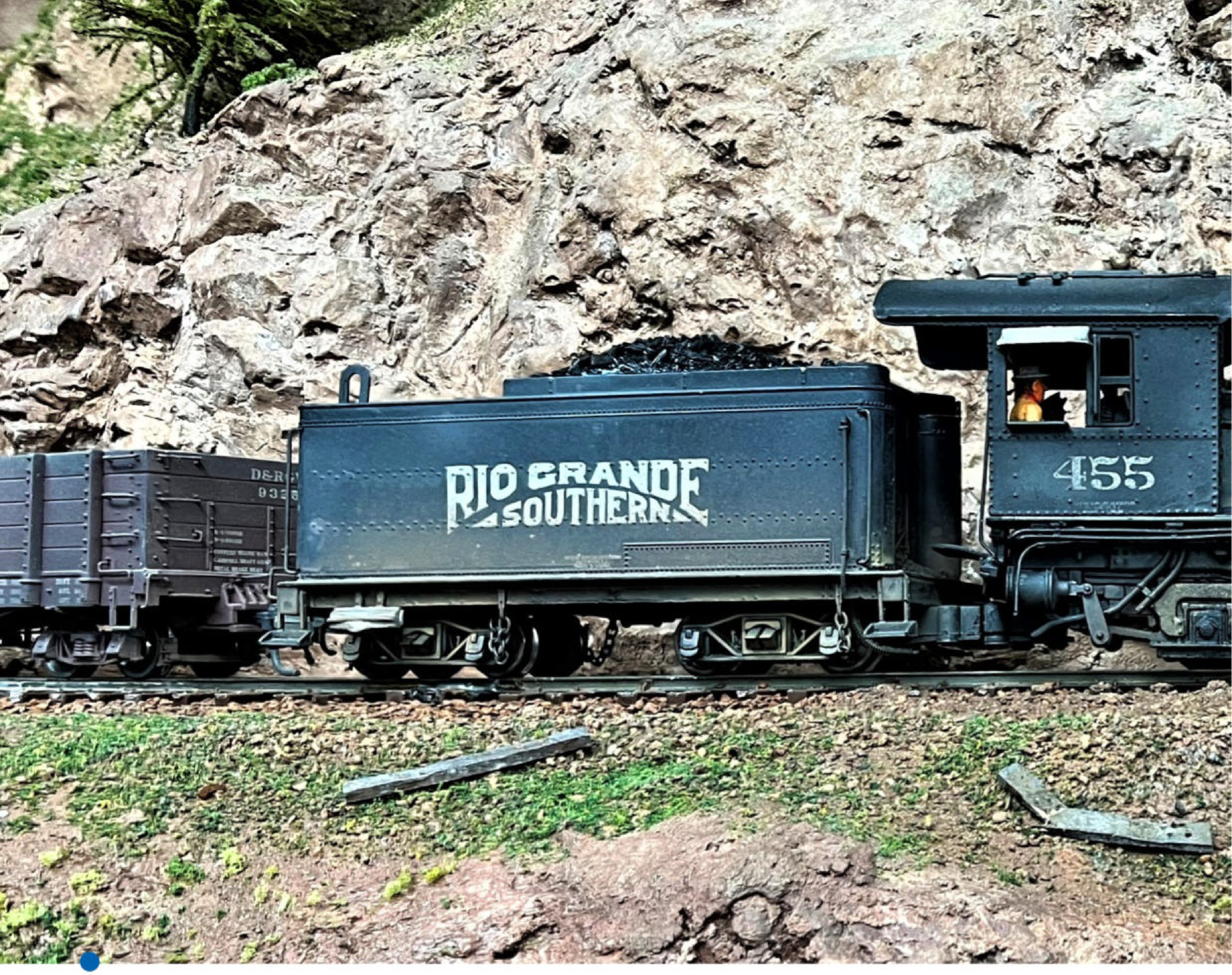
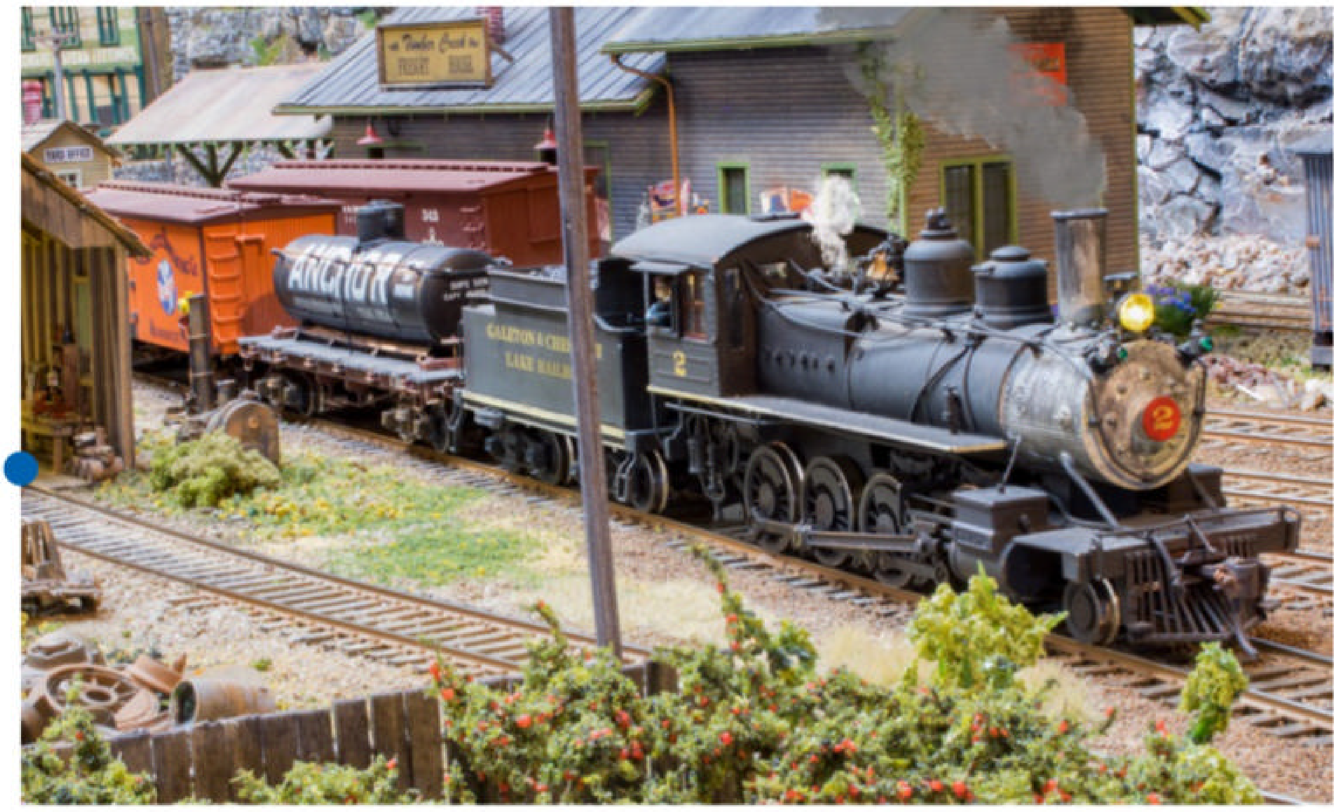
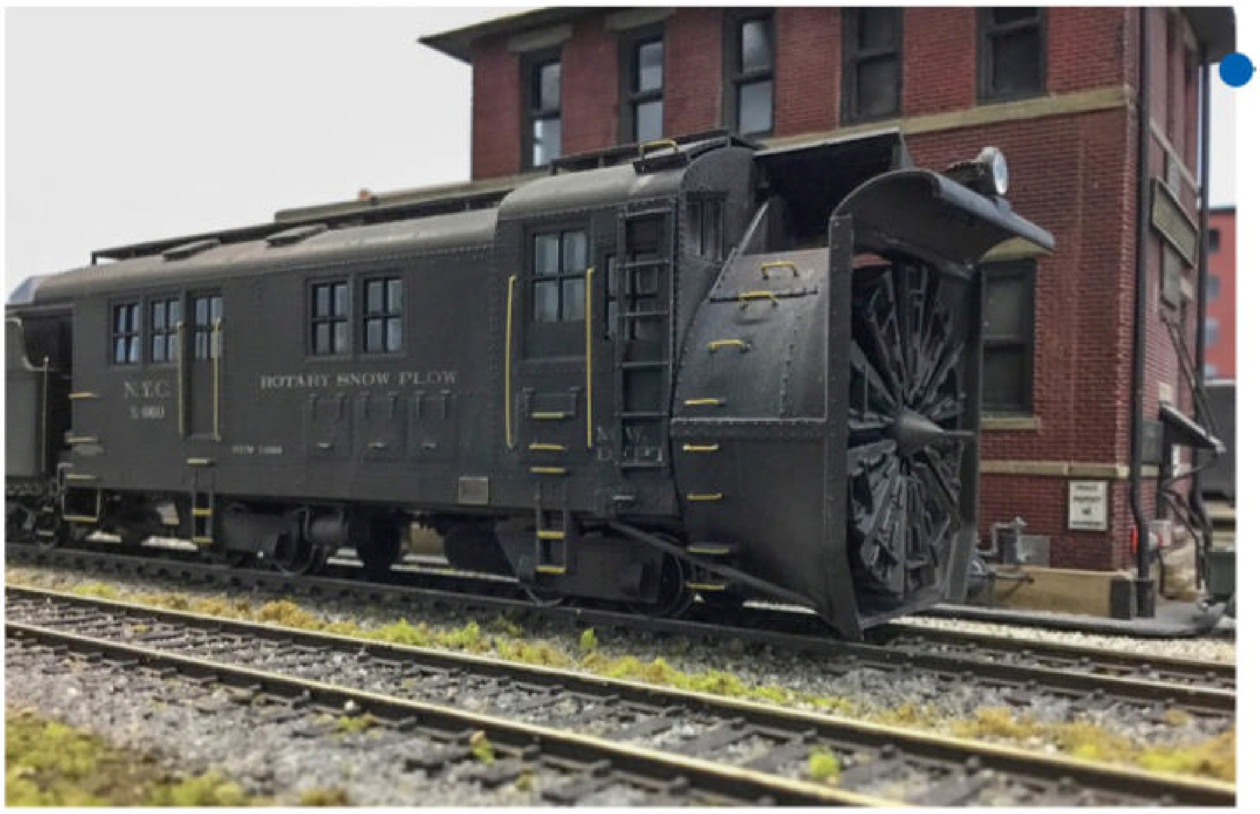
Extra 602W arrives at Rockville, Minn., in early September 1956. The Rockville depot burned down in 1953, so the agent from Cold Spring has to drive over in his Ford station wagon to meet the local. The photo was taken by Richard Remiarz on his HO scale Great Northern Ry. Willmar Division layout. The engine is an Atlas Electro-Motive Division GP7 detailed and painted by Joe Binish. The freight cars are resin kits from Sunshine, Yarmouth, and Funaro & Camerlengo.



Rio Grande Southern K-27 No. 455 hauls a string of gondolas through the rugged San Juan Mountains of southwest Colorado. John Vavra of Escondido, Calif., photographed the scene on his HO scale layout. The locomotive and gondola are from Blackstone. The rock faces were made with plaster cast in commercial latex rock molds with hand-carved plaster in between the castings.



A local freight headed by Galeton & Chestnut Lake RR 2-8-0 Consolidation No. 2 passes the Chestnut Lake freight house on its way to Galeton, Pa., with cars for the brewery and the oil dealer there. The photo and HO scale models are by Jerry Lauchle of State College, Pa. The Consolidation is an upgraded Sunset brass import. The structures are from Fine Scale Miniatures kits.



New York Central's big rotary plow is on standby, as lake-effect snow is forecast between Buffalo and Cleveland. Steve Lasher finished the Walthers model for Russ Weis's HO scale NYC themed layout by adding grab irons, a working headlight, and a SoundTraxx steam decoder. Russ shot the photo.

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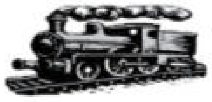

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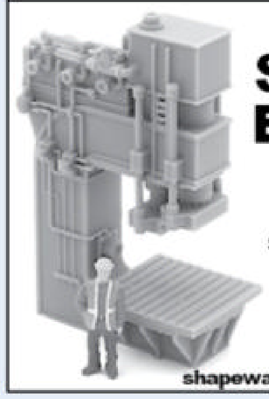

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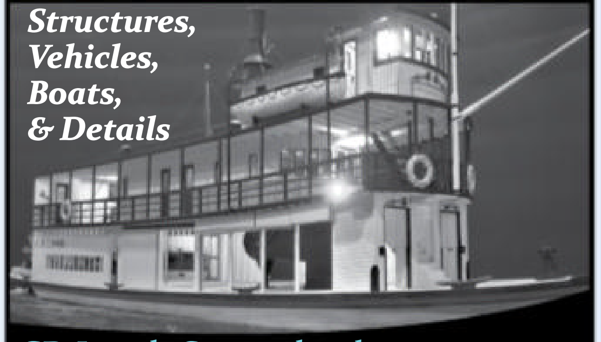

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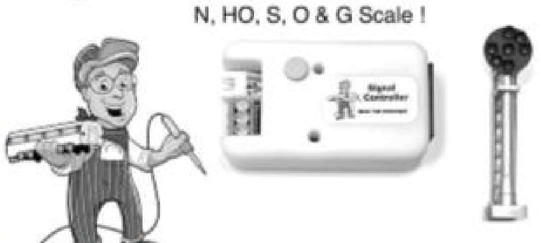

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Schedule of Events Rate: $45 per issue (55 word maximum). Ads will contain the following information about the event: state, city, sponsoring organization and name of event, meet, auction or show, dates, location, times, admission fee, name and/or telephone number and/or email of person to contact for information. Name, daytime telephone number and street address of the person providing the information is also required but need not be included in the ad. Unless otherwise requested, ads will be published in the issue month that the event occurs in. Please specify issue date(s). **Word Ad Rates;** per issue: 1 insertion — $2.03 per word, 6 insertions — $1.89 per word, 12 insertions — $1.77 per word. $40.00 MINIMUM per ad. To receive the discount you must order and prepay for all ads at one time. Count all initials, single numbers, groups of numbers (i.e. 4-6-0 or K-27), names, address number, street number, street name, city, state, zip, phone numbers each as one word. Example: John A. Jones, 2102 South Post St., Waukesha, WI 53187 would count as 10 words. For MR's private records, please furnish: a telephone number and, when using a P.O. Box in your ad, a street address. *Model Railroader* reserves the right to refuse listing. **All Copy:** Set in standard 6 point type. First several words only set in bold face. If possible, ads should be sent typewritten and categorized to ensure accuracy.

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All ads must be prepaid and pertain to the subject of model railroading.

Schedule of Events

AL, MOBILE: Model Train Show sponsored by South West Alabama Railroad Modelers (SWARM). Via Health, Fitness and Enrichment Center, 1717 Dauphin Street. March 4-5, 2023, Saturday 9:00am-5:00pm; Sunday 11:00am-4:00pm. Admission $8.00, family $15.00, under 10 free. Operating layouts, demonstrations, and dealers. Contact Charlie Boyer, 251-454-0572 (before 9pm CST), email: charlieboye66@att.net, or Glenn Samuel, 205-914-0693, email: gasamuel@aol.com

CO, COLORADO SPRINGS: Train Expo Colorado (TECO) hosts its next model train show on February 4-5, 2023. Saturday 10am-5pm and Sunday 10am-3pm. Colorado Springs Event Center, Hall B 3960 Palmer Park Blvd., Colorado Springs, CO 80909. Admission: $10/person, children 12 and under are free, senior and military discounts available. Contact Elizabeth 915-491-4819 or visit www.tecoshow.org

CO, DENVER: Rocky Mountain Train Show. April 1-2, 2023. National Western Complex, 4655 Humboldt St., Denver, CO 80216. Saturday, 9:00am-5:00pm, Sunday 9:00am-4:00pm. 3 acres of model trains, all scales, 30 layouts, 700 sales tables, clinics and more. Admission $13.00, under 12/scouts in uniform FREE. Discounted tickets available for military/first responders through VetTix.org. Free Parking. 303-364-0274, www.RockyMountainTrainShow.com

FL, SARASOTA/BRADENTON: 44th RealRail Train Show. February 18-19, 2023. Saturday 10am-4pm, and Sunday 10am-3pm. Bradenton Area Convention Center, 1 Haben Blvd., Palmetto, FL. Door prizes, interactive Lionel layout, kids' HO layout, Hobby Mart with 100+ vendors. Adult admission $8, 13 and under free w/paid adult. CDC guidelines apply. Contact David Fontaine for more information 941-685-2221 or david_f_34205@yahoo.com

GA, SAVANNAH: Coastal Rail Buffs 34th Annual Model Railroad and Train Show at the Savannah Mall, 14045 Abercorn St., Savannah, GA 31419, between Target and Bass Pro Shop. March 4-5, 2023, Saturday 10:00am-5:00pm, Sunday 10:00am-4:00pm. Adults 2-day admission $7.00; Students/Seniors $5.00, Active-Duty Military/under 12 FREE. Dealer tables, operating layouts in O, HO, N. Visit: www.coastalrailbuffs.com

IA, MONTICELLO: 2023 Train Show. 2 Days, February 4-5, 2023. Saturday 10am-5pm and Sunday 9am-1pm. Berndes Center, Jones County Fairgrounds, 766 N. Maple St., Monticello, IA 52310. Tables $30. Admission: $5, children under 12 free with paid adult. Monticello RR Club, PO Box 169, Monticello IA 52310 or email Ron Ackermann at rack611@gmail.com

IA, SIOUX CITY: Cosmopolitan Train Show. Marina Inn Conference Center, 385 E. Fourth St., South Sioux City, NE 68776. March 11-12, 2023. Saturday, 9am-4pm and Sunday, 10am-4pm. Adults $8, kids 12 and under free w/adult. 180+ vendor tables, 12+ layouts, 2 seminars & activities for all! Concessions, free parking. Contact: John Koskovich, 712-898-6935, johnkoskovich@aol.com

IL, SPRINGFIELD: Springfield Railroad Society Annual Train Fair. Orr Building on the Illinois State Fairgrounds. Sunday, March 12, 2023. 10:00AM-4:00PM. Early bird shopping starts at 9:00AM for $10.00. Admission fee $5.00 from 10:00AM to 4:00PM. Free parking. Largest show in downstate Illinois! For info call Ray at 217-544-4295 or Mike at 217-899-3100 or visit www.springfieldtrainfair.com

IN, LA PORTE: Duneland Model RR Club Train Show and Swap Meet. La Porte County Fairgrounds Community Building, 2581 In-2, La Porte, IN 46350. Sunday, February 26, 2023, 9:30am-2:00pm (Chicago time). Adults $5.00, youths 6-12 $1.00, 5 and under free. Contact: Dave Novak at trains86@myyahoo.com or 219-778-3195. (Masks are optional.)

IN, LEBANON: Central Indiana Division/NMRA Train Show. Boone County 4H Fairgrounds, 1300 E 100 S, Lebanon, IN 46052. Sunday, January 29, 2023, 10:00am-3:00pm. Admission $3.00 or $5.00 family. Dealers, Portable Train Layouts, Clinics, Door prizes. Dealer tables $16.00. Contact, Jim Shellhaas at 317-750-4834 or jshellha@butler.edu

KS, LAWRENCE: Lawrence Model Railroad Club 21st Annual Train Show and Swap Meet. Crown Toyota, 3400 S. Iowa St., Lawrence, KS 66046. March 4-5, 2023, Saturday 9am-5pm; Sunday 9am-3pm. Admission: Adults $8.00, children 12 & under free with paid adult. Contact: Jim Turner, 785-393-6207 or more information at: www.lawrencemodelrailroadclub.org

MN, WOODBURY: Newport Model RR Club Train Flea Market. Woodbury High School, 2665 Woodlane Drive, Woodbury, MN 55125. Saturday, January 14, 2023, 9:00am-2:00pm. Admission $5.00. Club Address: Newport Train Club, PO Box 0061, St. Paul Park, MN 55071. Contact: Don, 763-257-5443

NC, ASHEVILLE: Asheville Train Show. Western North Carolina Agricultural Center. February 24-25, 2023. Friday noon-7:00pm and Saturday 9:00am-5:00pm. Admission $6.00, under 10 free. All scales, all gauges, collectibles, artifacts, operating layouts, hundreds of vendor tables. More: www.Asheville-Trainshow.com

NC, NEW BERN: 27th Annual Train Show. New Bern Riverfront Convention Center, 203 S. Front St., New Bern, NC 28560. March 4-5, 2023, Saturday 9:00am-5:00pm; Sunday 10:00am-4:00pm. Admission $8.00, under 12 free w/adult. Operating layouts, over 90 vendor tables, food concession. George Creathorne, 201-213-6907

NJ, TOMS RIVER: ECTP and Collectibles LLC presents the Toms River Toy & Train Game Day Show. Elks Lodge, 600 Washington St., Toms River, NJ 08753. Sunday, February 12, 2023, 9:00am-2:00pm. Admission: $7.00; under 12 free with adult. John LaLima 732-845-5966. Go to www.eastcoasttrainparts.com and click on Toms River Show.

NY, BUFFALO/HAMBURG: WNYRHS Train & Toy Show. February 18-19, 2023. Fair Grounds Event Center. 5820 South Park Ave., Hamburg, NY 14075. Saturday 10:00am-5:00pm, Sunday 10:00am-4:00pm. 350+ tables. Adults: $8.00, Children 12 and under FREE. NMRA (WNY-Div) meeting Sat. 10:30. NMRA-Modeling clinics/demo's, layouts, LEGO, children's area. Bring the family! Stroller friendly! Contact: Art Toale 716-837-1791, Email: feebeelovr@yahoo.com

OH, TOLEDO: Greater Toledo Train & Toy Show. Owens Community College (SHAC), 30335 Oregon Rd., Perrysburg, OH 43551. Sunday, March 12, 2023, 11:00am-3:00pm. "Early Birds" 9:00am-3:00pm. Adults $7, Early Bird Adults $10, Children 12 and under FREE w/ paid adult. Contact: Randy Ramsey, 1566 South Ave., Toledo, OH 43609, 419-215-4181, email: toledotoymasters@gmail.com, website: www.toymasters.org

OK, STILLWATER: Winter Train Show. Saturday, February 18, 2023, 9am-3pm. Payne County Fairgrounds Expo Hall. 3 miles east of Stillwater on Hwy 51. 4518 Expo Cir E, Stillwater, OK 74075. Operating layouts and door prizes. Concessions available. Admission: $5.00, kids under 18 free. For information: www.ttos-soonerdiv.org

SC, EASLEY: CRMHA MODEL TRAIN EXPO 2023. February 17-18, 2023. Friday, noon-6pm. Saturday, 9am-3pm. Impact Center at Rock Springs Church, 207 Rock Springs Road, Easley, SC 29642. Admission: $8.00 Adults, good for both days. Children under 10 are FREE. Trains of all sizes, operating layouts, model train vendors, a Kid Zone, and more! Visit: www.crmha.org

TX, HOUSTON: Greater Houston Train Show presented by the San Jacinto Model Railroad Club. Saturday, February 18, 2023, 10:00am-4:30pm. Pasadena Convention Center, 7902 Fairmont Parkway, Pasadena, TX 77504. Operating Layouts, Classes on Railroads and Modeling Subjects, NMRA Contests, and Vendors from across the Southwest. Admission: $5 adults, under 12 FREE, $10 Family. Concessions, free parking. Info: http://sanjacmodeltrains.org/

WA, CHEHALIS: Lewis County Model Railroad Club, Annual Spring Train Show and Swap Meet. Southwest Washington Fairgrounds, Blue Pavilion Building, 2555 N. National Ave., Chehalis, WA 98532. April 1-2, 2023. Saturday 10:00am-4:00pm and Sunday 10:00am-2:00pm. Admission $5.00. Free parking. Contact information: Ted, 360-985-7788, or email: TedsTrains@LewisCounty.com

WI, LA CROSSE: The 31st Annual Great Tri-State Rail Sale. La Crosse Center, 2nd & Pearl Streets. Saturday, January 28, 2023. 9:00am-3:00pm. Admission $5.00, under 12 free. 300 vendor tables. All Scales; Model, Toy & Antique Trains & Memorabilia. Information: 4000 Foundation, PO Box 3411, La Crosse, WI 54602, 608-781-9383. Visit: www.4000foundation.com

WI, MADISON: Mad City Model Railroad Show. February 18-19, 2023, Alliant Energy Center. 100,000 square feet of layouts, clinics, exhibits and vendors. Adults $14, Seniors $13, Children (5-15) $6, under 5 Free. Two-day pass $20. Saturday 9am-5pm, Sunday 9am-4pm. Ticket deals: nmra-scwd.org

WI, STEVENS POINT: CWMR 25th Annual Model Railroad Show. Holiday Inn Convention Center Hotel. 1001 Amber Avenue. January 21-22, 2023. Saturday 9:00am-5:00pm. Sunday 10:00am-3:00pm. Adults $4.00, kids 12-17 $2.00. Many layouts, swap/sales tables, vendors. Contact Jim Miller, 715-340-0265; email: jimbro67@gmail.com

WV, CHARLESTON: KVRA Model Railroad Show. Charleston Convention Center. 200 Civic Center Dr., Charleston, WV 25301. March 11-12, 2023. Saturday, 10am-6pm & Sunday, 10am-4pm. Admission $5.00, children 12 and under free. Tables $30.00. Clinics, layouts, new and used equipment for sale. Website: www.kvrailroad.org. Contact Joe: 304-539-6721 or kvrailroad@gmail.com

All listed events were confirmed as active at the time of press. Please contact event sponsor for current status of the event.

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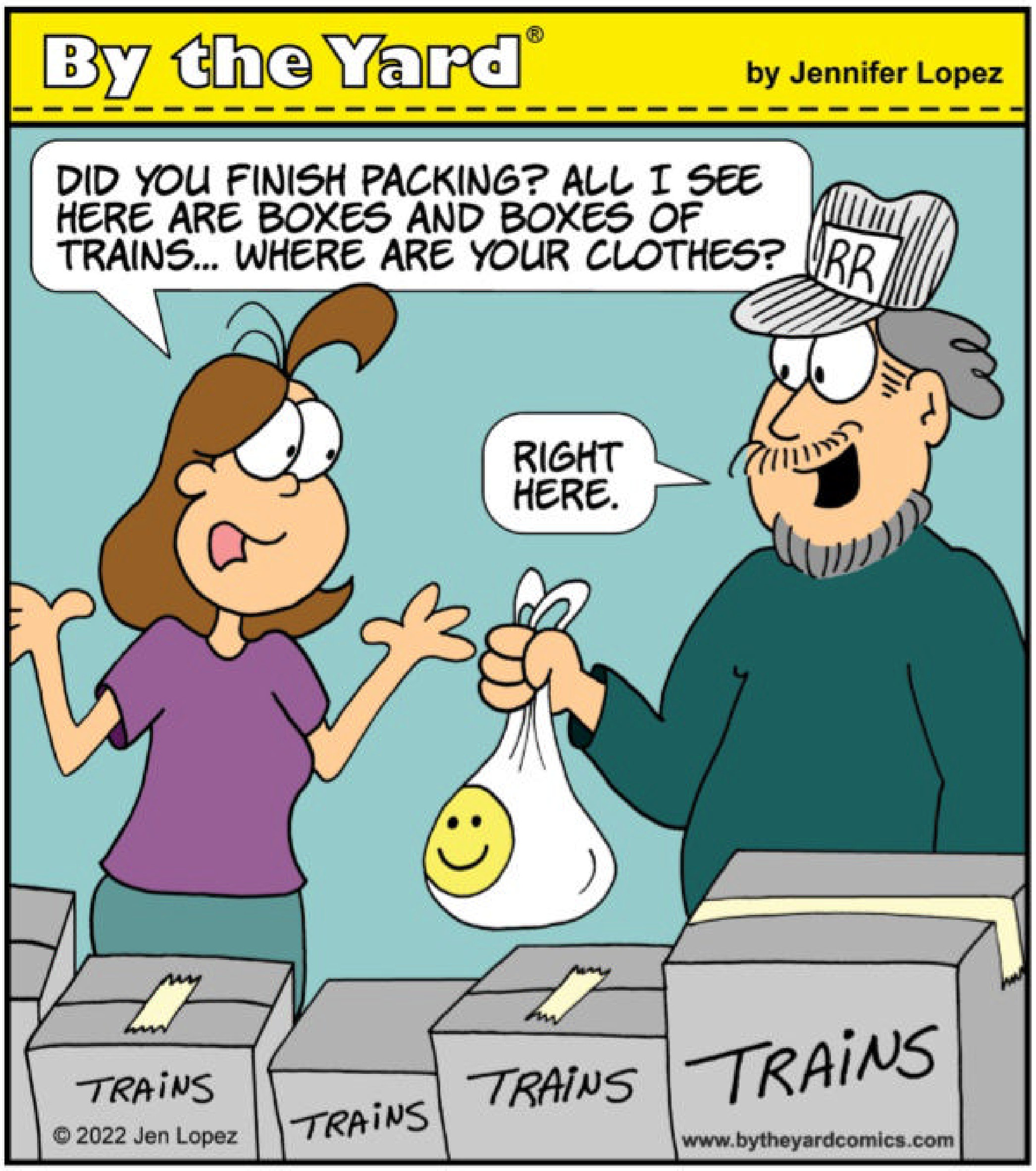

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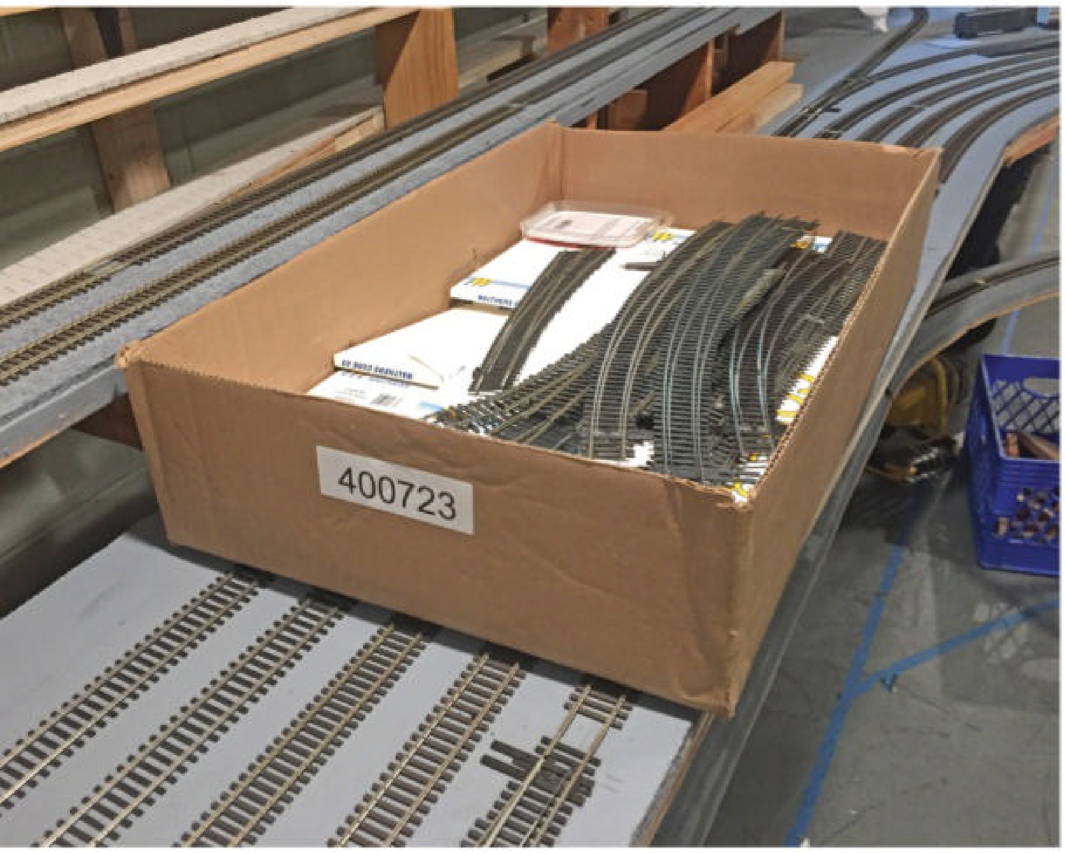
By Tony Koester

How long is a short circuit?



You wouldn't suspect a cardboard box sitting on the railroad would cause a mysterious short circuit – until you turned it over and discovered some copper-clad staples on the bottom.

Tom Schmieder photo

Or maybe this should be titled, "Short stories." But I like the one above that appeared on a series of emails among some good model railroading friends. Credit for it goes to Tom Schmieder's father for "one of his bad mechanical-engineer-who-works-at-Bell-Labs dad jokes." There are lessons here for the neophyte and veteran alike.

The occasion was Tom's progress report on his basement-size HO Delaware, Lackawanna & Western. "Just when we're gaining momentum building the railroad, laying track, and grafting it onto an already wired-up system, I'm confronted with a sporadic short circuit. I just love sporadic problems; they are so easy to track down.

"We had revised some trackage. The reconfigured track has been put back in, but it is not wired yet. It now bridged two circuit-breaker sections, and both were occasionally tripping simultaneously. I needed to have the existing trackwork operational, as I use it to program and test-run customers' models. (Tom does business as Real Sound Solutions.)

"I did the obvious and checked all the loose-hanging wires, made sure there were no tools anywhere on the layout, and cut gaps in the track between the two sections. That isolated the short to one breaker section, but I still could not find any obvious reasons why there would be a short. Because we've been nipping rails with a Xuron tool, which makes little metal fragments fly everywhere, I vacuumed all the tracks to remove any errant shards of metal that could cause a short, but found none.

"I use a short-circuit detector I assembled from an article in the *NMRA Magazine* or one of the regional newsletters: a piezo speaker, some alligator clips, and a 9-volt battery in a prescription medicine bottle. I remove any conductive equipment from the rails such as locomotives and clip one wire to each of the rails; if there's a short, it closes the circuit, and the piezo speaker sounds. As I moved a cardboard box full of turnouts off the tracks in Portland yard, the short circuit detector stopped sounding. A cardboard box – that shouldn't cause a short. I checked the underside to see if there was something stuck there that could cause a short and found the culprit: four copper-clad packaging staples! Staples are now taped over to prevent that from happening again.

"The most challenging short circuit pursuit that I experienced was on Harold Werthwein's huge Erie RR layout. Many hours were expended searching, cleaning, isolating, reducing the footprint of the shorted section, and rechecking until someone could hear the muffled 'ticking' of the short under a turnout as the circuit breaker repeatedly attempted to reset. Harold's handlaid track was beautifully executed, but a couple of spikes on opposing rails near the frog contacted each other below the surface of the Homasote!"

Bob Willer uses a spiral notebook to record details of operating sessions, problems, and other such things that crop up, then was bewildered when he couldn't find a short. "It took me days, many days, to find the miscreant notebook lying across the rails as the cause," Bob recalls. The spiral wire binding was the culprit.

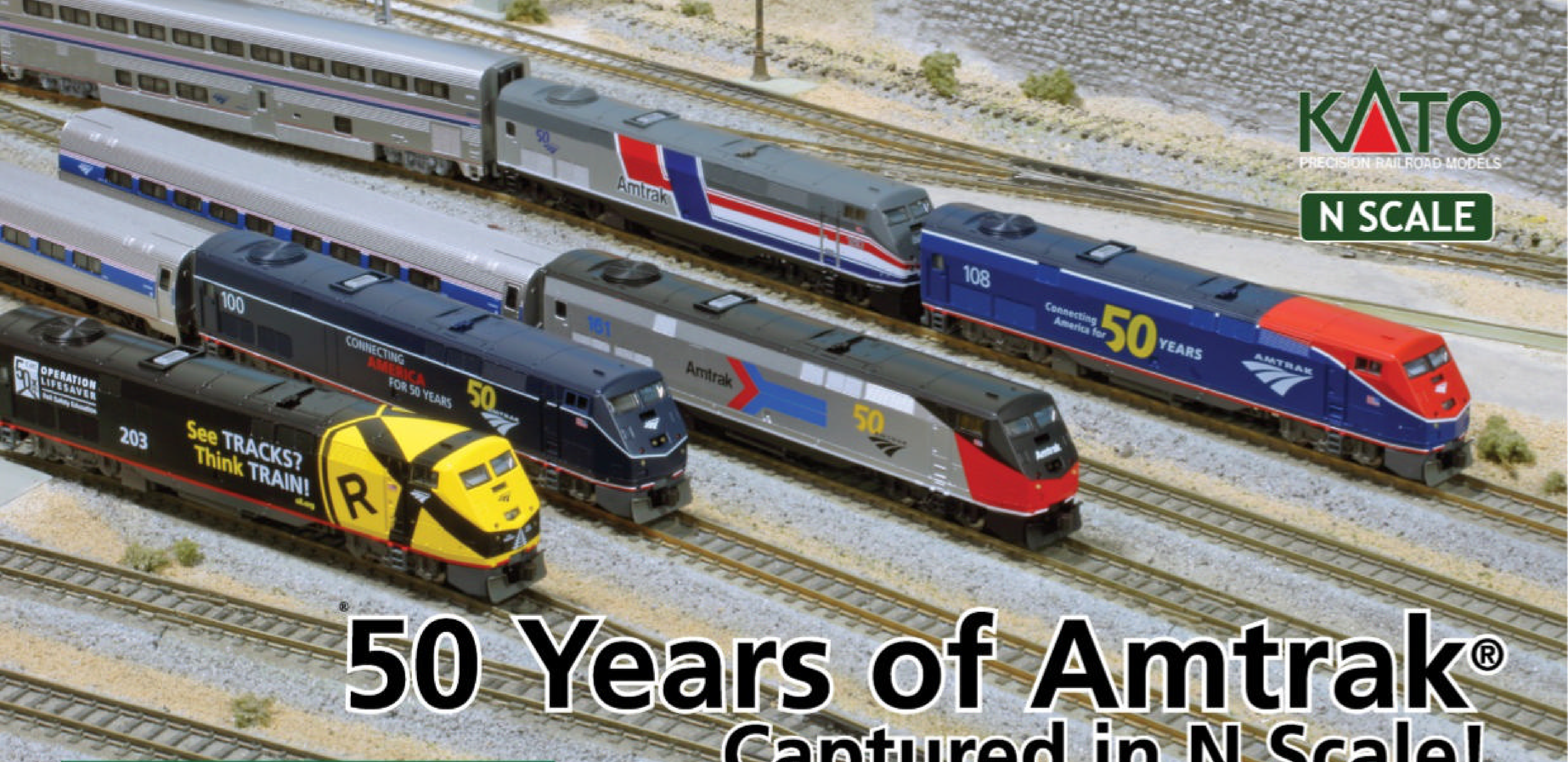
Mark Steenwick's short story is one of the best: two unattached wires, with stripped ends, hanging below the railroad, then pushed together by moving a box into strategic position.

That reminded MR's On Operation columnist Jerry Dziedzic that he dreads "cleaning track with anything that rubs, however lightly I rub it. It doesn't take much to close a gap. It's always the gap where a teeny-meeny strip of styrene insulation has loosened. Now, go find the offending gap." (No, we are not going to discuss track-cleaning methods today.)

My own short story, one I related decades ago, involved a mysterious short at South Fork yard on the Allegheny Midland. To isolate it, I cut gaps in every rail across the center of the entire yard, which showed the problem was on the south end. I suspected the spikes-touching-under-a-frog problem that Harold Werthwein had encountered, but that wasn't it. I finally had it isolated to a length of track about a foot long that contained no turnouts or other electrical features. Its only distinguishing feature was a blacktop grade crossing.

Aha! The light finally went on. The grade crossing was paved between two guard rails using plaster I had darkened with carbon black to resemble asphalt. I had created a conductive resistor. MR

MARK STEENWICK'S SHORT STORY IS ONE OF THE BEST: TWO WIRES WITH STRIPPED ENDS, HANGING BELOW THE RAILROAD, PUSHED TOGETHER BY MOVING A BOX.
– TONY



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176-6036-DCC	NEW!	N GE P42 Amtrak Phase I 50th Anniversary #161 w/ DCC	$215
176-6037	NEW!	N GE P42 Amtrak Phase VI 50th Anniversary #108	$135
176-6037-DCC	NEW!	N GE P42 Amtrak Phase VI 50th Anniversary #108 w/ DCC	$215
176-6038	NEW!	N GE P42 Amtrak "Dash 8" Phase III 50th Anniversary #160	$135
176-6038-DCC	NEW!	N GE P42 Amtrak "Dash 8" Phase III Anniversary #160 w/ DCC	$215
176-6039	NEW!	N GE P42 Amtrak Operation Lifesaver #203	$140
176-6039-DCC	NEW!	N GE P42 Amtrak Operation Lifesaver #203 w/ DCC	$220
106-6286		N Amfleet & Viewliner Intercity Express Phase VI 3-Car Set Includes: Amfleet II Coach, Amfleet II Cafe, Viewliner I Sleeper	$105

NEW ITEMS ARRIVING EARLY 2023

176-6035-LS	NEW!	N GE P42 Amtrak "Midnight Blue" 50th Anniversary #100 w/ ESU LokSound	$335
176-6036-LS	NEW!	N GE P42 Amtrak Phase I 50th Anniversary #161 w/ ESU LokSound	$335
176-6037-LS	NEW!	N GE P42 Amtrak Phase VI 50th Anniversary #108 w/ ESU LokSound	$335
176-6038-LS	NEW!	N GE P42 Amtrak "Dash 8" Phase III 50th Anniversary #160 w/ ESU LokSound	$335
176-6039-LS	NEW!	N GE P42 Amtrak Operation Lifesaver #203 w/ ESU LokSound	$340
10-1789	NEW!	N Amtrak Superliner Phase VI 6-Unit Bookcase Set Includes: Viewliner II Baggage, Superliner II Transition Sleeper, Superliner I Sleeper Superliner I Diner, Superliner I Lounge, Superliner I Coach	$205
156-0980	NEW!	N Amtrak Superliner I Coach Phase VI #34006	$30
156-0981	NEW!	N Amtrak Superliner I Coach Phase VI #34026	$30

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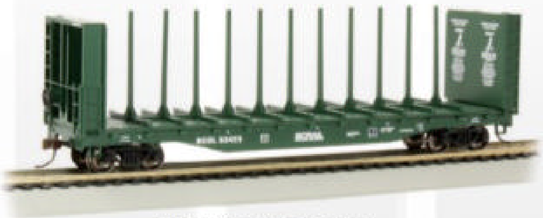

BC RAIL #52423
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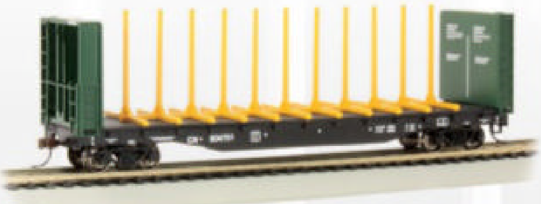
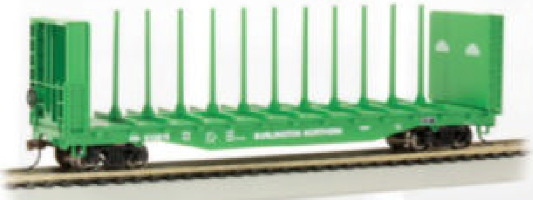


CANADIAN NATIONAL #604751
Item No. 12902



BURLINGTON NORTHERN #615816
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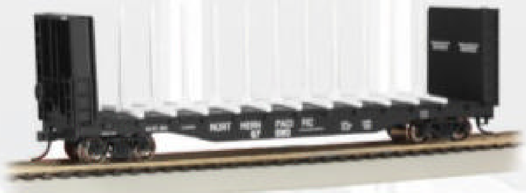
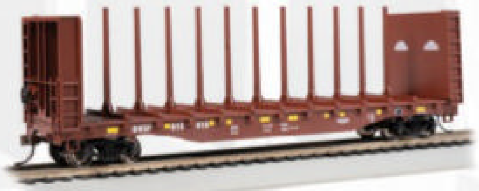


NORTHERN PACIFIC #67080
Item No. 12904



BNSF #615818 NEW
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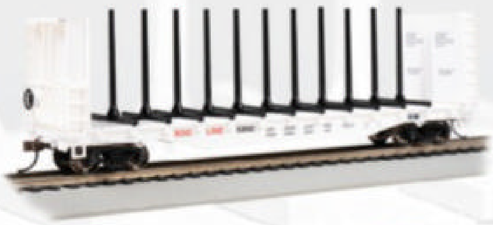

SOO LINE #5060 NEW
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